Miller
The Power of Blue.

Processes

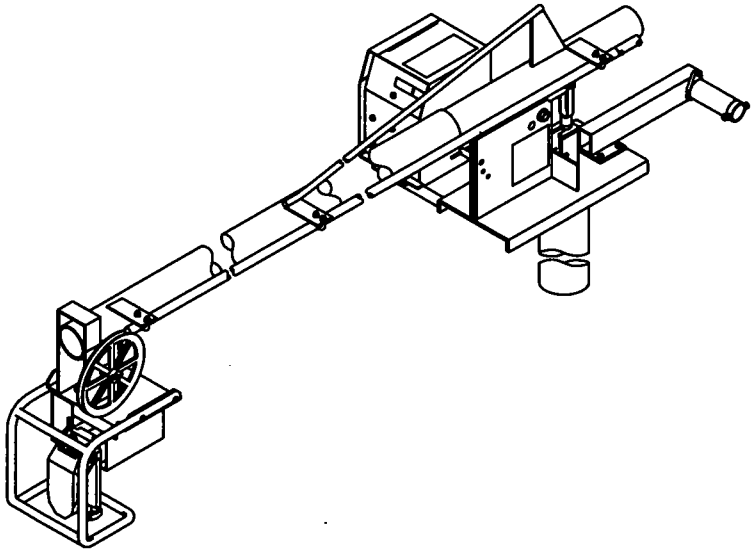
Pulsed MIG (GMAW-P)

MIG (GMAW)
Flux Cored (FCAW)
(Gas- and Self-Shielded)

Description

Wire Feeder
(Use with CC/CV Power Sources)

SS-64M Swingarc™



OM-1586K

February 1997

Effective with
Serial Number
KH339697

OWNER'S MANUAL

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Neils Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. To locate your nearest distributor call 1-800-4-A-Miller.

Miller
The Power of Blue.

SS-64M Swingarc™

Description

Put the benefits of technology to work on the production line. The SS-64M represents a major advancement in wire feed technology, and delivers the ultimate in versatility, simplicity, programmability and performance.

The SS-64M feeder includes special features for pulsed MIG (GMAW-P) welding that requires the use of inverter-type power sources. However the SS-64M retains the versatility that makes it perfectly suited to conventional MIG processes using a variety of Miller CV or CC/CV machines.

For pulsed MIG welding, the SS-64M features built-in memory with eight, factory-set synergic pulse programs. Each program is specific for a wire type, wire size and gas mixture. Any of these programs can be modified for the specific requirements of your welding application.

Front Panel Features

- 2-line by 16-character backlit LCD
- Single push-button parameter select control
- Single knob parameter adjustment
- Trigger hold control for making extended welds without holding gun trigger
- Wire jog control feeds wire without energizing the contactor
- Gas purge control purges line without energizing feeder

Side Panel Features

- 4-line by 20-character backlit LCD for parameter and mode displays
- Push-button programming controls for process, sequence, dual schedule, and data card modes
- Parameter select push button
- Parameter increase/decrease push buttons

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Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

Call 1-800-4-A-MILLER for your local Miller distributor.

Your distributor gives you ...

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

1. Safety Precautions – Read Before Using

1.1 Symbol Usage

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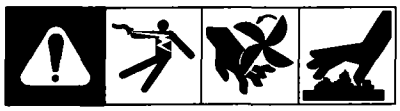
Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*



This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1.2 Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1.3. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

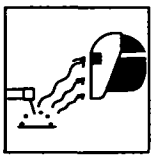
ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Noise from some processes can damage hearing. Chipping, grinding, and welds cooling throw off pieces of metal or slag.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- *If inside, ventilate the area and/or use exhaust at the arc to* remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- *Work in a confined space only if it is well ventilated, or while* wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

CYLINDERS can explode if damaged.

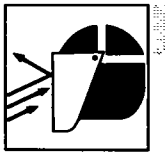
Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

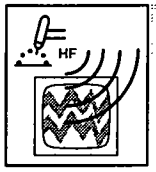
- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

Chipping and grinding cause flying metal. As welds cool, they can throw off pieces of metal or slag.

- Wear a face shield to protect eyes and skin.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not locate unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

OVERUSE can cause OVERHEATING

- Allow cooling period, follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.

MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.

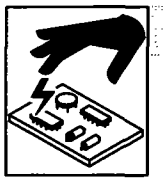
WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

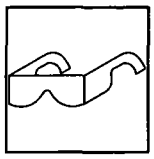


STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



FLYING METAL or DIRT can injure eyes.

- Wear safety glasses with side shields or face shield.

FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.

1.3 Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1.4 EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper*, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): ". . . there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around the body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

The above procedures are also recommended for pacemaker wearers. Consult your doctor for complete information.

1. Consignes de Sécurité pour le Soudage à l'arc

1.1 Signification des symboles

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Signifie Mise en garde! Attention! Ce mode opératoire peut présenter des dangers! Les dangers possibles sont indiqués par les divers symboles.

▲ **Indique un message de sécurité spécial.**

☞ *Signifie NOTA; pas lié à la sécurité*

Ce groupe de symboles signifie Mise en garde! Attention!, risque de CHOCS ÉLECTRIQUES, dangers présentés par les PIÈCES MOBILES et les PIÈCES CHAUDES. Voir les symboles et les consignes associées ci-après pour prendre les mesures nécessaires afin de se prémunir contre les dangers.

1.2 Dangers du soudage à l'arc

⚠ MISE EN GARDE

Les symboles donnés ci-après sont utilisés dans tout le manuel pour attirer l'attention sur les dangers possibles et pour indiquer le type de danger dont il s'agit. Quand on voit le symbole, prendre garde et suivre les directives correspondantes pour éviter le danger. Les consignes de sécurité données ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Lire et respecter toutes ces normes de sécurité.

L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.

Aucune personne, et particulièrement les enfants, ne doit se trouver à proximité du poste de soudage.

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

1. Ne jamais toucher les pièces électriques sous tension.
2. Porter des gants et des vêtements de protection secs ne comportant pas de trous.
3. S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
4. Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
5. Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et au codes nationaux, provinciaux et municipaux.
6. Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
7. En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
8. Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
9. Mettre l'appareil hors tension quand on ne l'utilise pas.
10. Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
11. Ne pas enrouler les câbles autour du corps.
12. Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
13. Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
14. N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
15. Porter un harnais de sécurité quand on travaille en hauteur.
16. Maintenir solidement en place tous les panneaux et capots.
17. Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.

LE RAYONNEMENT DE L'ARC peut brûler les yeux et la peau. Le BRUIT peut endommager l'ouïe; les PROJECTIONS DE LAITIER OU LES ÉTINCELLES peuvent blesser les yeux.

L'arc de soudage produit des rayons visibles et invisibles intenses (ultraviolets et infrarouges) qui peuvent brûler les yeux et la peau. Le bruit produit par certains procédés peut endommager l'ouïe. Des projections de métal ou de laitier sont produites par le piquage, le meulage ou le refroidissement des soudures.

BRUIT

1. Utiliser des bouche-oreilles ou des serre-tête antibruit approuvés si le niveau de bruit est élevé.

RAYONNEMENT DE L'ARC

2. Porter un masque à serre-tête muni d'un verre filtrant de nuance appropriée pour protéger le visage et les yeux quand on soude ou observe le travail de soudage (voir les normes ANSI Z49.1 et Z87.1 données sous la rubrique Principales normes de sécurité).
3. Porter des lunettes de sécurité approuvées avec écrans latéraux.
4. Utiliser des paravents ou des barrières de protection pour protéger les personnes à proximité contre les coups d'arc et l'éblouissement; avertir les autres personnes de ne pas regarder l'arc.
5. Porter des vêtements de protection en tissu ignifuge durable (laine et cuir) et des chaussures de sécurité.

LES VAPEURS ET LES FUMÉES peuvent être dangereuses pour la santé.

Le soudage produit des vapeurs et des fumées qu'il est dangereux de respirer.

1. Garder la tête à l'extérieur des vapeurs et des fumées et ne pas les respirer.
2. À l'intérieur, ventiler le poste de travail ou utiliser un dispositif placé au niveau de l'arc pour évacuer les vapeurs et fumées de soudage.
3. Si la ventilation est mauvaise, utiliser un appareil respiratoire à adduction d'air pur approuvé.
4. Consulter les fiches signalétiques et les consignes du fabricant relatives au métaux, produits d'apport, revêtements, nettoyants et dégraissants.
5. Ne travailler dans un espace confiné que s'il est bien ventilé, ou en portant un appareil respiratoire à adduction d'air pur. Demander à un observateur ayant reçu la bonne formation de toujours se tenir à proximité. Les vapeurs et fumées de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène et causer des blessures graves voire mortelles. S'assurer que l'air est propre à la respiration.
6. Ne pas souder à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir avec les vapeurs pour former des gaz hautement toxiques et irritants.
7. Ne pas souder sur des métaux revêtus comme l'acier galvanisé, au plomb ou cadmié à moins que la pièce n'ait été entièrement décapée, que le poste de travail soit bien ventilé. S'il y a lieu, porter un appareil respiratoire à adduction d'air pur. Les revêtements et les métaux qui contiennent de tels éléments peuvent dégager des vapeurs toxiques lors du soudage.

LES BOUTEILLES peuvent exploser si elles sont endommagées.

Les bouteilles contenant des gaz de protection sont à haute pression. Une bouteille endommagée peut exploser. Étant donné que les bouteilles de gaz font normalement partie du matériel de soudage, les traiter avec le plus grand soin.

1. Protéger les bouteilles de gaz comprimé contre la chaleur intense, les chocs, le laitier, les flammes nues, les étincelles et l'arc.
2. Placer les bouteilles à la verticale en les fixant à un support fixe ou à un chariot pour éviter qu'elles ne tombent ou ne basculent.
3. Tenir les bouteilles à l'écart du poste de soudage ou d'autres circuits électriques.
4. Ne jamais poser un chalumeau soudeur sur une bouteille de gaz.
5. Ne jamais laisser une électrode de soudage toucher une bouteille.
6. Ne jamais souder sur une bouteille sous pression : elle exploserait.
7. N'utiliser que des bouteilles de gaz de protection, des détendeurs, des tuyaux souples et des raccords appropriés conçus pour l'application particulière; conserver ces matériels et leurs pièces en bon état.
8. Éloigner le visage de la sortie du robinet de la bouteille quand on l'ouvre.
9. Replacer le chapeau sur la bouteille après utilisation.
10. Lire et suivre les consignes relatives aux bouteilles de gaz comprimé, au matériel connexe ainsi que la publication P-1 de la CGA donnée sous la rubrique Principales normes de sécurité.

LE SOUDAGE peut causer un incendie ou une explosion.

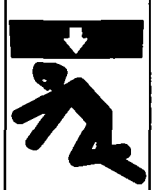
Ne pas souder sur des récipients fermés comme des réservoirs, des fûts ou des tuyaux : ils peuvent exploser. L'arc de soudage peut produire des étincelles. Des étincelles, une pièce chaude et un matériel chaud peuvent provoquer des incendies et des blessures. Le contact accidentel de l'électrode sur des objets métalliques peut produire des étincelles, l'explosion, la surchauffe ou un incendie. S'assurer que le lieu ne présente pas de danger avant d'effectuer le soudage.

1. Se protéger et protéger les personnes à proximité des étincelles et du métal chaud.
2. Ne pas souder dans un endroit où les étincelles peuvent atteindre des matériaux inflammables.
3. Enlever toutes les matières inflammables dans un rayon de moins de 10 m de l'arc. Si cela n'est pas possible, bien les recouvrir en utilisant des bâches approuvées.
4. Prendre garde que les étincelles et les projections ne pénétrent dans des zones adjacentes en s'infiltrant dans des petites fissures et ouvertures.
5. Prendre garde aux incendies et toujours avoir un extincteur à proximité.
6. Se rappeler que si l'on soude sur un plafond, un plancher, une cloison ou autre, le feu peut prendre de l'autre côté.
7. Ne pas souder sur des récipients fermés comme des réservoirs, des fûts ou des tuyaux à moins qu'ils ne soient préparés de façon appropriée conformément à la norme F4.1 de l'AWS (voir la rubrique Principales normes de sécurité).
8. Raccorder le câble de retour à la pièce, le plus près possible de la zone de soudage, pour empêcher que le courant de soudage ne suive une trajectoire longue et éventuellement inconnue et qu'il ne provoque des risques d'électrocution et d'incendie.
9. Ne pas utiliser le chalumeau soudeur pour dégeler des tuyaux.
10. Enlever l'électrode enrobée du porte-électrode ou couper le fil de soudage au ras du bec contact quand on ne l'utilise pas.
11. Porter des vêtements de protection non huileux comme des gants en cuir, une chemise épaisse, des pantalons sans revers, des chaussures montantes et un casque.
12. Ne pas porter des matières combustibles sur soi comme un briquet à gaz ou des allumettes quand on soude.

1.3 Autres dangers relatifs à l'installation, l'utilisation et l'entretien

UN INCENDIE OU UNE EXPLOSION peut être causé par un appareil placé au contact, au-dessus ou à côté de surfaces combustibles.

1. Ne pas placer l'appareil au contact, au-dessus, ou à côté d'une surface combustible.
2. Ne pas installer l'appareil à côté d'un objet ou d'un produit inflammable.



EN TOMBANT, LE MATÉRIEL peut s'endommager ou causer des blessures graves.

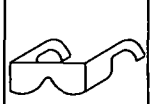
1. N'utiliser l'anneau de levage que pour soulever l'appareil; NE PAS l'utiliser pour soulever les chariots, les bouteilles de gaz ou autres accessoires.
2. Pour soulever la source de courant, utiliser des appareils de puissance suffisante.
3. Si l'on utilise un élévateur à fourche pour déplacer l'appareil, s'assurer que la fourche est suffisamment longue et dépasse de l'autre côté de l'appareil.

LES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

1. Ne pas toucher les pièces chaudes les mains nues.
2. Laisser une période de refroidissement avant de toucher le pistolet ou la torche.

LES PIÈCES MOBILES peuvent causer des blessures.

1. Se tenir à l'écart des pièces en mouvement comme les ventilateurs.
2. S'assurer que tous les capots, panneaux, portes et protecteurs sont bien fermés et fermement maintenus.



LES ÉCLATS DE MÉTAL ou LES SALETÉS peuvent provoquer des lésions aux yeux.

1. Porter des lunettes de sécurité avec écrans latéraux ou écran facial.

LES CHAMPS MAGNÉTIQUES PRODUITS PAR LES COURANTS ÉLEVÉS peuvent nuire au fonctionnement du stimulateur cardiaque

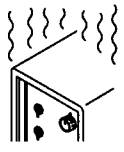
1. Les personnes qui portent un stimulateur cardiaque doivent se tenir éloignées du poste de soudage.
2. Les personnes qui portent un stimulateur cardiaque devraient consulter leur médecin avant de s'approcher d'un poste de soudage ou de gougeage à l'arc ou de soudage par points.

LES PIÈCES MOBILES peuvent provoquer des blessures.

1. Se tenir à l'écart des pièces mobiles.
2. Se tenir à l'écart des points de pincement, ex. : galets d'entraînement.

LE FIL DE SOUDAGE peut percer la peau.

1. Attendre les instructions avant d'appuyer sur la gâchette.
2. Ne pas pointer le pistolet sur une partie du corps, sur d'autres personnes, ou sur une pièce métallique lorsqu'on enfile le fil de soudage.

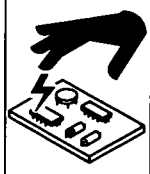


UNE UTILISATION EXCESSIVE peut se traduire par une SURCHAUFFE DU MATÉRIEL.

1. Laisser une période de refroidissement.
2. Réduire le courant ou le facteur de marche avant de recommencer à souder.
3. Utiliser le facteur de marche nominal.

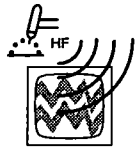
L'ACCUMULATION DE GAZ DE PROTECTION peut être nuisible à la santé voire mortel.

1. Quand on n'utilise pas le gaz de protection, fermer le robinet de la bouteille.



L'ÉLECTRICITÉ STATIQUE peut endommager les pièces des circuits imprimés.

1. Mettre un bracelet antistatique AVANT de manipuler les cartes de circuits imprimés ou les pièces.
2. Utiliser des sacs et boîtes antistatiques adéquats pour ranger, déplacer ou expédier les cartes de circuits imprimés.



LA HAUTE FRÉQUENCE peut créer des interférences dans les systèmes de radionavigation, les services de sécurité, les ordinateurs et le matériel de télécommunications.

1. Ne confier cette installation qu'à un personnel qualifié et connaissant bien l'équipement électronique.
2. L'utilisateur a la responsabilité de faire corriger rapidement par un électricien qualifié les problèmes d'intrférences résultant de l'installation.
3. Dans le cas d'un avertissement d'interférence donné par le Conseil fédéral des communications, arrêter d'utiliser immédiatement l'équipement.
4. Faire vérifier et entretenir régulièrement l'installation.
5. Tenir les portes et panneaux de la source de haute fréquence bien fermés, maintenir les éclateurs au bon réglage et utiliser une mise à la terre et un écran de protection afin de réduire au minimum la possibilité d'interférences.

UNE TENSION C.C. IMPORTANTE est présente sur les onduleurs après que l'on ait coupé l'alimentation.

1. Avant de toucher les pièces, mettre l'onduleur hors tension, couper l'alimentation et décharger les condensateurs d'entrée conformément aux directives de la section Entretien.

1.4 Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1.5 Informations sur les champs électromagnétiques

NOTA Données sur le soudage et sur les effets des champs électriques et magnétiques basse fréquence.

Voici une citation tirée des conclusions générales du document Biological Effects of Power Frequency Electric & Magnetic Fields - Background Paper (Effets biologiques des champs électriques et magnétiques aux fréquences d'utilisation - Document de base), OTA-BP -E-53 (Washington, DC : U.S Government Printing Office, mai 1989) publié par l'Office of Technology Assessment (Congrès des États-Unis): «... des expériences au niveau cellulaire et des études sur l'homme et l'animal nous ont apporté une foule de renseignements : il est maintenant clair que les champs magnétiques basse fréquence peuvent influer sur les systèmes biologiques et les modifier. Ces travaux sont généralement d'excellente qualité, mais les résultats obtenus sont complexes. Dans l'état actuel de nos connaissances dans le domaine scientifique, nous ne sommes pas en mesure d'interpréter nos observations à la lumière d'une théorie générale. Et, ce qui est encore plus regrettable, nous ne pouvons rien affirmer de définitif au sujet des risques éventuels, ni proposer des méthodes scientifiques précises pour réduire ces risques ou pour les éviter.»

Pour réduire l'intensité des champs magnétiques au poste de travail :

1. Grouper solidement les câbles en les entrelaçant ou en les serrant avec un ruban adhésif.
2. Disposer les câbles sur un seul côté et à l'écart de l'opérateur.
3. Éviter d'enrouler les câbles ou de les poser sur l'épaule.
4. Éloigner le plus possible la source de courant et les câbles de soudage.
5. Raccorder le connecteur de pièce à la pièce à souder, le plus près possible de la soudure.

Stimulateurs cardiaques :

Les recommandations ci-avant s'adressent aussi, normalement, aux personnes qui utilisent un stimulateur cardiaque. Pour de plus amples renseignements, consultez votre médecin.

2. Introduction

2.1 Specifications

Type of Input Power	Welding Power Source Type	Wire Feed Speed Range	Wire Diameter Range	Welding Circuit Rating	Weight
24 Volts AC Single-Phase 10 Amperes 50/60 Hertz	Constant Voltage (CV) DC For GMAW Or Constant Voltage (CV) / Constant Current (CC) DC For GMAW-P All Need 14-Pin And Contactor Control	Standard: 50 To 780 ipm (1.3 To 19.8 mpm) Optional High Speed: 92 To 1435 ipm (2.3 To 36.5 mpm)	.023 To 1/8 in (0.6 To 3.2 mm) Max Spool Weight: 60 lb (27 kg)	100 Volts, 750 Amperes, 100% Duty Cycle	12 ft (3.7 m): 160 lb (73 kg) 16 ft (4.9 m): 210 lb (95 kg)

	12 ft (3.7 m) Boom	16 ft (4.9 m) Boom
Maximum Height With 4 ft (1.2 in) Post	17 ft (5.2 m)	21 ft (6.4 m)
Weight	Net: 160 lb (73 kg); Ship: 280 lb (127 kg)	Net: 210 lb (95 kg); Ship: 350 lb (159 kg)
Vertical Lift Of Boom	Horizontal to 60° Above Horizontal	Horizontal to 60° Above Horizontal

3. Installation

3.1 Installing Swivel into Pipe Post

ST-152 268

1 Swingpak Base or CBC Cart

2 Pipe Post With Base

3 Steel Bolt

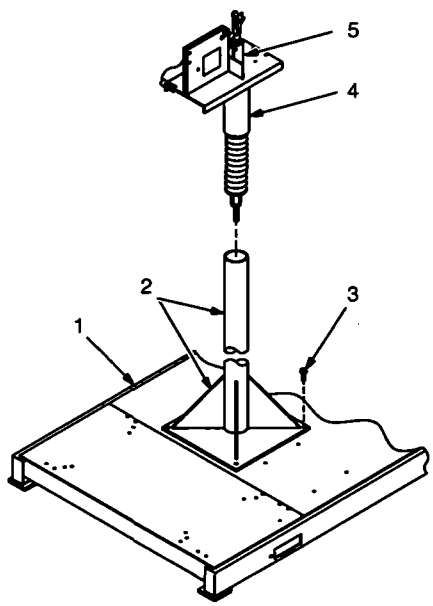
Secure as shown using as a minimum 1/2 in diameter SAE grade 5 steel bolts.

4 Swivel Assembly

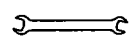
Insert into pipe post. Lubricate swivel.

5 Safety Collar

▲ **Do not remove until instructed to.**

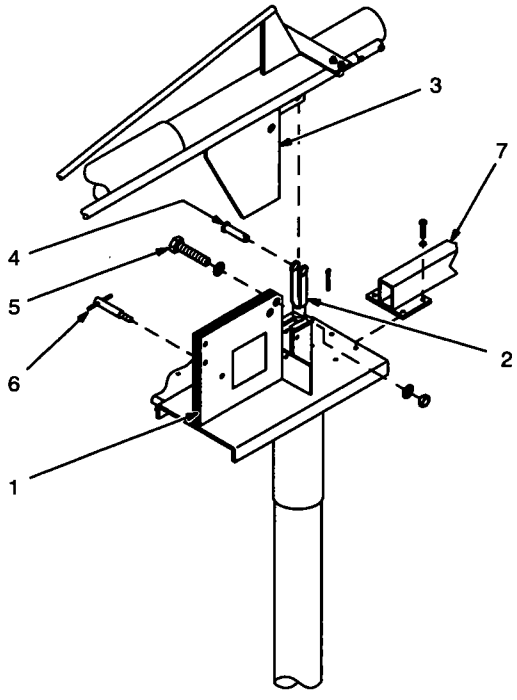


Tools Needed:


3/4 in

3.2 Installing Boom and Reel Support

ST-142 596-C



1 Swivel Plates

2 Yoke

Remove hardware from swivel plates and yoke.

3 Boom

Set boom into swivel as shown.

4 Yoke Pin

Install pin through yoke. Install cotter pin and spread ends.

5 Bolt

Install bolt, tighten hardware, and back bolt off one half turn.

6 Locking Knob

Install locking knob but do not tighten.

7 Reel Support

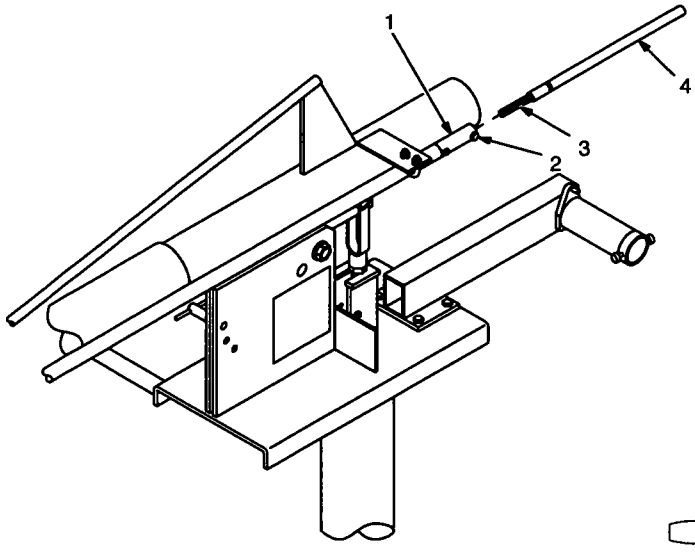
Install reel support.

Tools Needed:

3/8, 3/4 in

3.3 Installing Wire Guide Extension

ST-152 323



1 Wire Guide Fitting

2 Bolt

3 Monocoil Liner

4 Wire Guide Extension

Tighten bolt to secure liner in wire guide fitting. Do not overtighten bolt and crush liner.

Tools Needed:

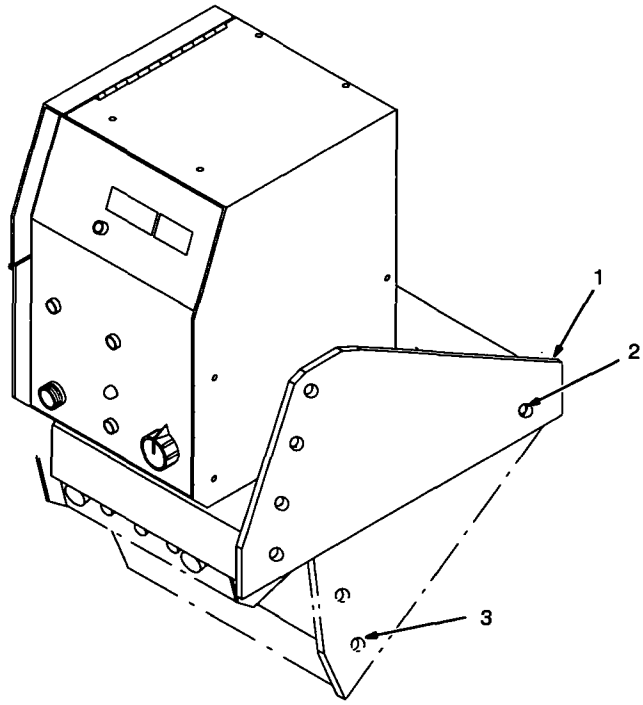
3/8 in

3.4 Adjusting Control Tilt Bracket

1 Tilt Bracket
2 Rear Pivot Screw
3 Front Screw

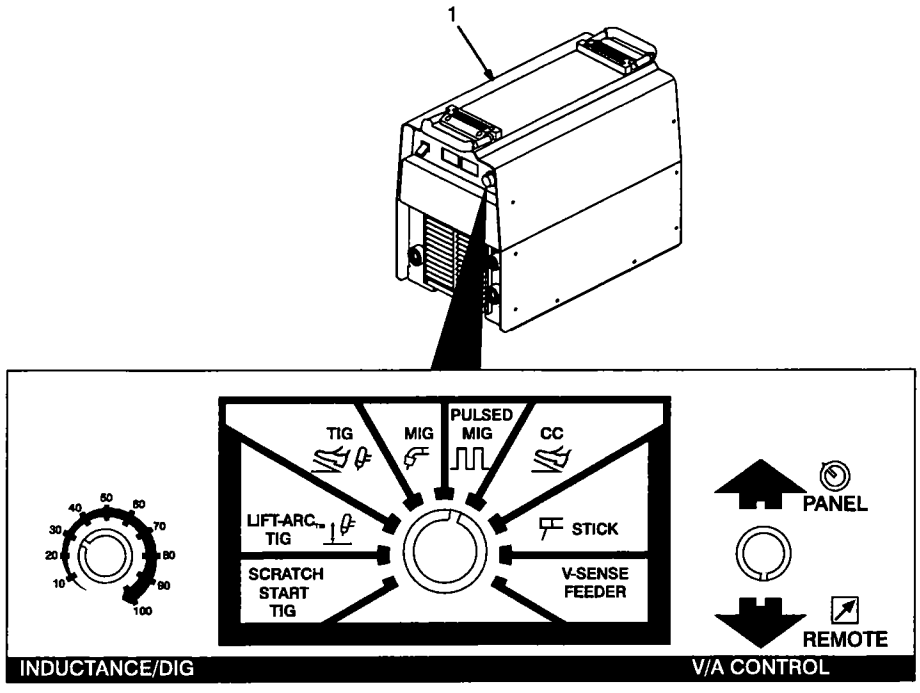
Loosen rear pivot screw. Remove front screw. Pivot control downward to desired viewing angle. Replace and tighten front screw. Tighten pivot screw.

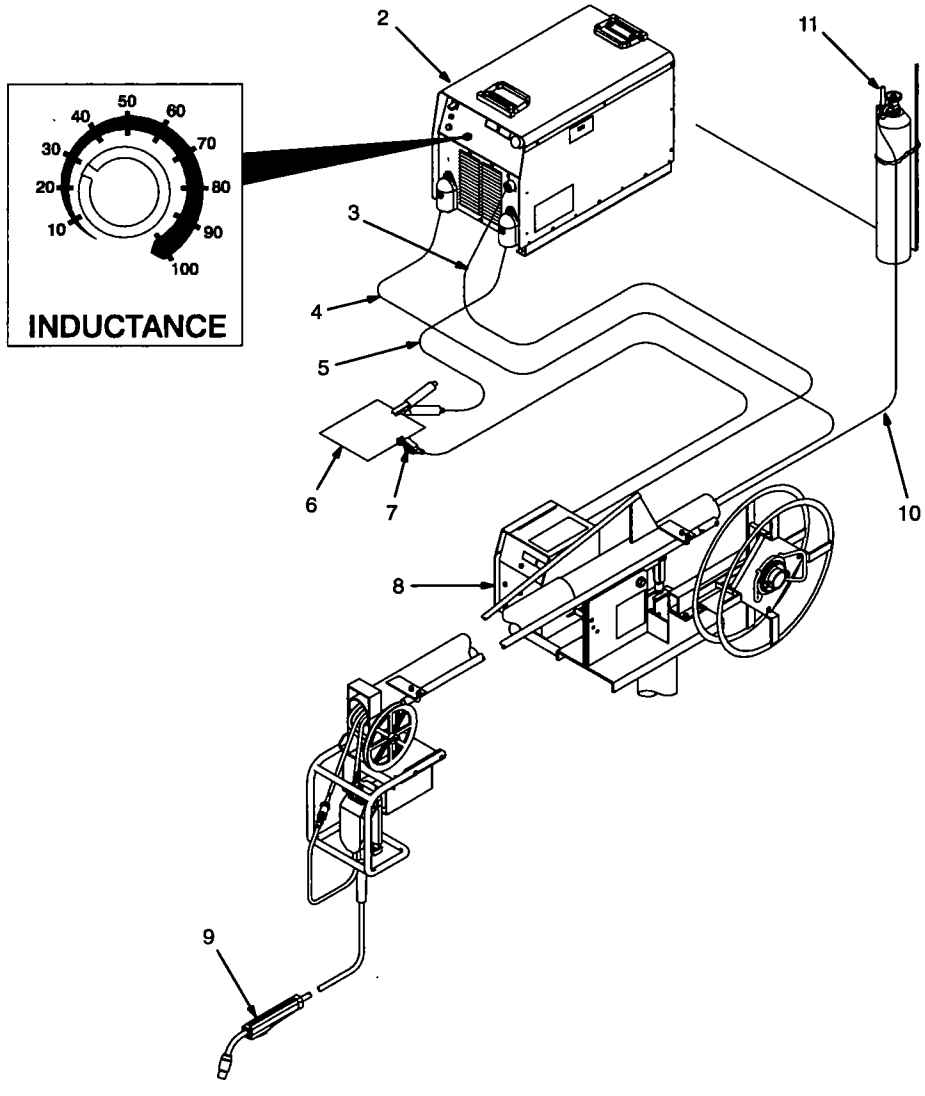
ST-801 279



3.5 Equipment Connection Diagram

ST-801 805 / Ref. ST-175 086 / Ref. ST-180 311-B





1 300/400 Ampere Model CC/CV Inverter Welding Power Source

☞ *Use settings shown for both pulse MIG welding and MIG welding.*

2 450 Ampere Model DC Inverter Welding Power Source

3 14-Pin Cord

4 Positive (+) Weld Cable

5 Negative (–) Weld Cable

Be sure weld cables are sized properly for peak amperage if pulse welding (see welding power source Owner's Manual).

6 Workpiece

7 Voltage Sensing Lead (Optional Use)

8 Wire Feeder

For connections see Section 3.7.

9 Gun

Be sure gun is rated for peak amperage if pulse welding. Install according to its Owner's Manual.

10 Gas Hose From Boom

11 Shielding Gas Supply

3.6 Connecting Weld Cables And Gas Hoses

Ref. ST-801 805 / Ref. ST-152 800-A

The weld cable and shielding gas hose extend 10 ft (3 m) from the boom.

Route weld cable from boom through reed relay, if applicable.

If the welding power source or gas supply are further from the boom, extend cable or hose as follows:

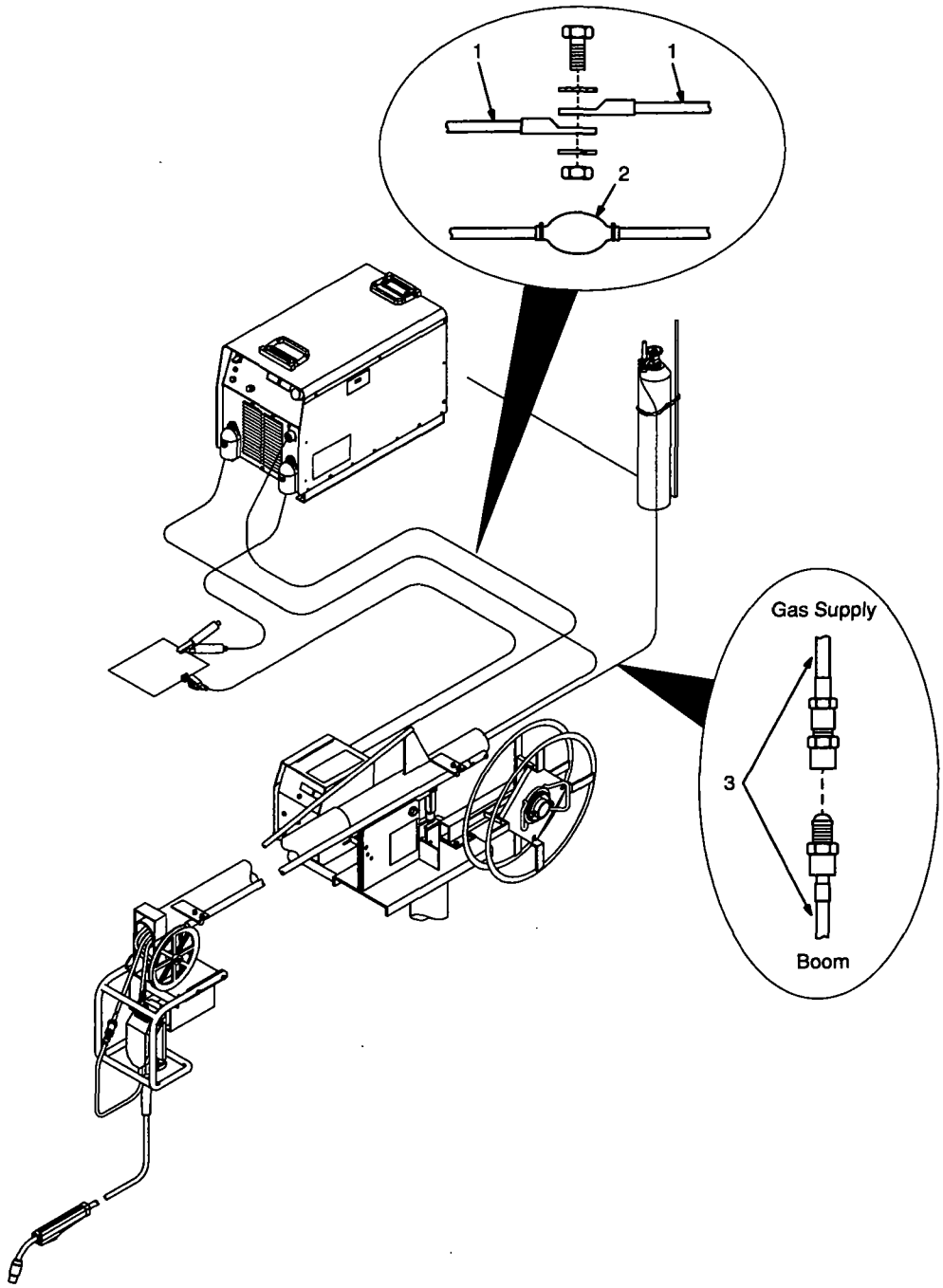
1 Weld Cable

2 Insulated Sleeving

Bolt together weld cables from welding power source and boom. Use electrical tape and insulated sleeving to cover connection.

3 Shielding Gas Hose

Connect hose to gas supply or extension hose. The hose from the boom has 5/8-18 right-hand threads.



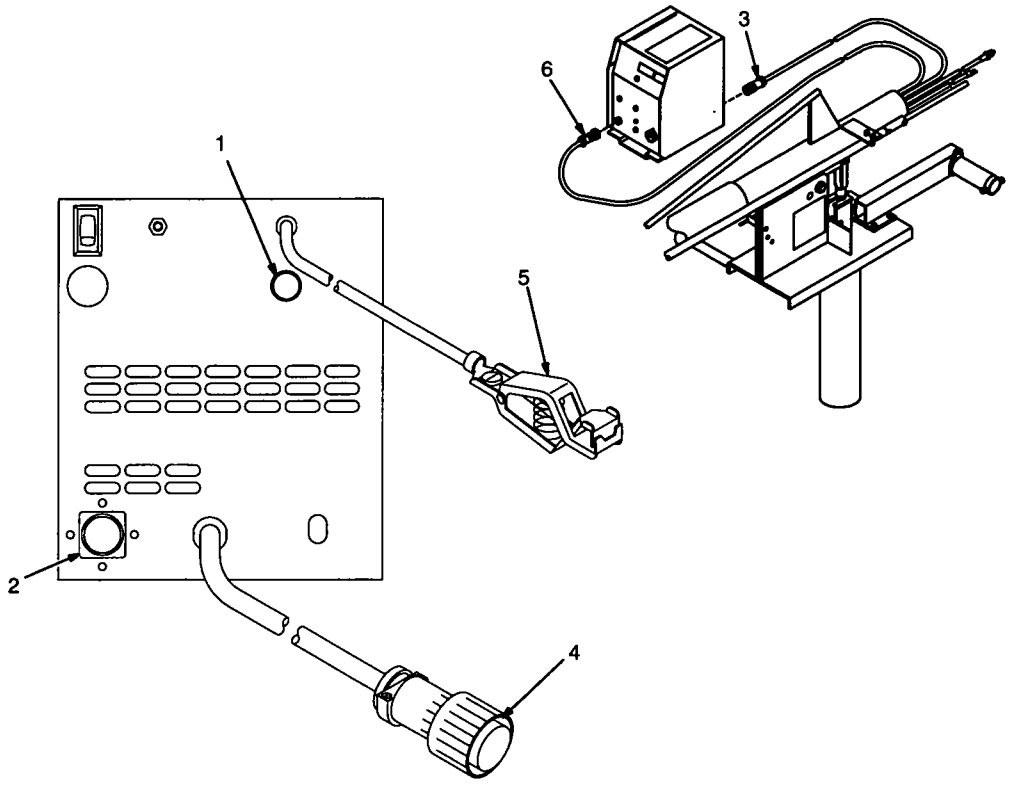
Tools Needed:

5/8 in

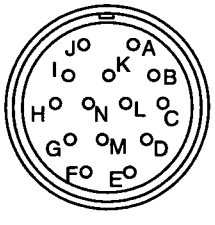
3.7 Control Box Connections

ST-157 433-B / Ref. ST-157 434

1 Optional Reed Relay Connection
2 Wire Feed Motor And Gas Valve Control Receptacle
3 Wire Feed Motor And Gas Valve Control Plug From Boom
4 14-Pin Cord
5 Volt Sense Lead (Optional Use)
6 Gun Trigger Plug From Boom



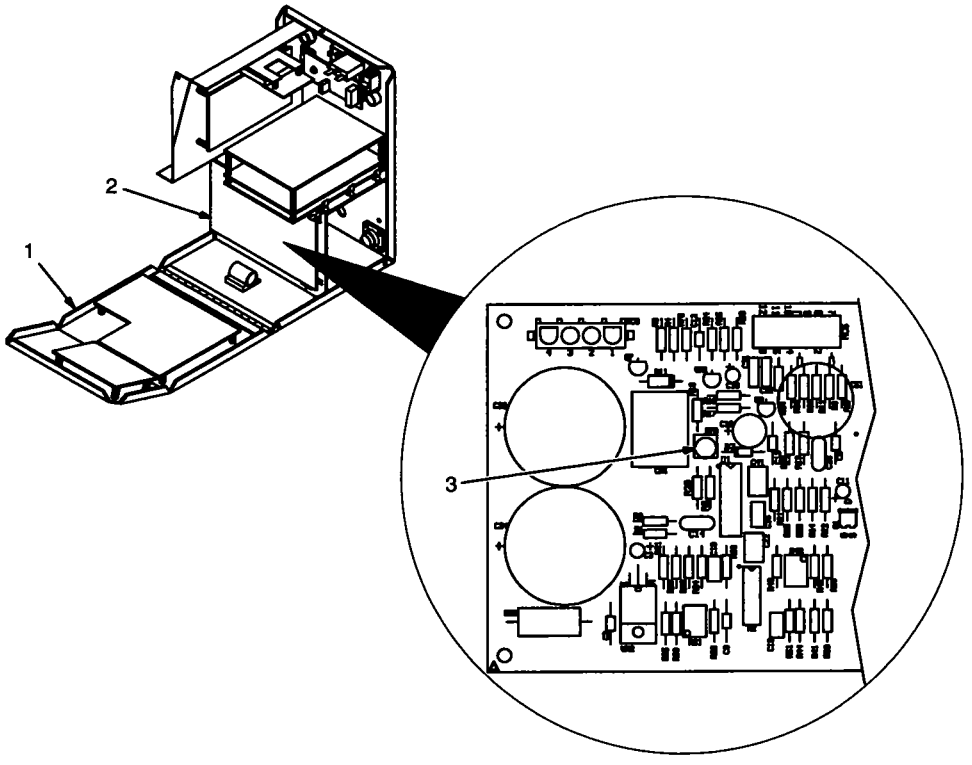
3.8 14-Pin Plug Information

REMOTE 14	Pin*	Pin Information
	A	24 volts ac with respect to socket G.
	B	Contact closure to A completes 24 volts ac contactor control circuit.
	G	Circuit common for 24 volts AC circuit.
	C	+10 volts dc output to remote control with respect to socket D.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control with respect to socket D.
	H	Voltage feedback; 0 to +10 volts dc, 1 volt per 10 arc volts.
	F	Current feedback; 0 to +10 volts dc, 1 volt per 100 amperes.
	M	CC/CV Select (+24 V = CV)
	N	Inductance (0-10 V)

*The remaining pins are not used.

3.9 Motor Start Control

ST-157 480-A / Ref. SB-146 862-D



To change wire feed starting speed proceed as follows:

Turn Off unit and welding power source.

Remove wrapper.

1 Front Panel

Remove screw from upper left corner, and open hinged front panel.

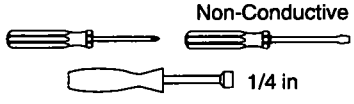
2 Motor Board PC1

3 Motor Start Control Potentiometer R70

Rotate potentiometer clockwise to increase time it takes the motor to ramp up to speed. Remove protective white rubber cap before making adjustment. Adjust potentiometer R70 using a small non-conductive screwdriver.

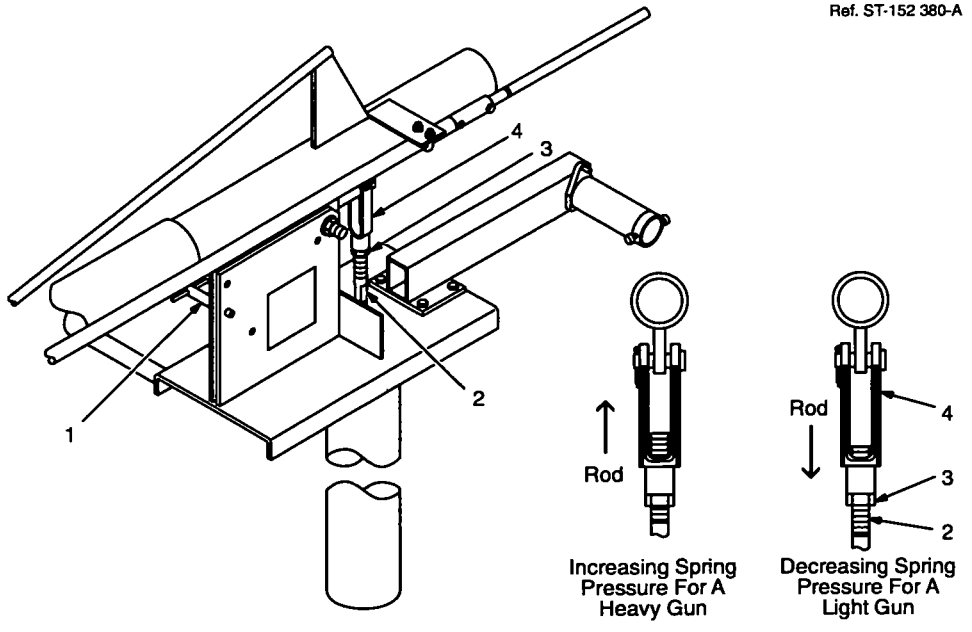
Close and secure front panel, and reinstall wrapper.

Tools Needed:



3.10 Removing Safety Collar and Adjusting Boom

Ref. ST-152 380-A



1 Locking Knob

Tighten knob to prevent boom movement. Loosen knob to allow boom movement. Change knob position to limit upward movement.

Pull boom down slightly and remove safety collar. Boom should balance in any position from horizontal to 60 degrees above horizontal. If necessary, adjust boom as follows:

2 Threaded Rod

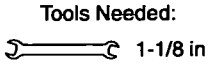
3 Jam Nut

Loosen jam nut and turn threaded rod until boom balances. Tighten jam nut. Be sure several full threads are through yoke to prevent boom falling.

4 Yoke

Retain safety collar for use in disassembling or moving boom.

Tools Needed:



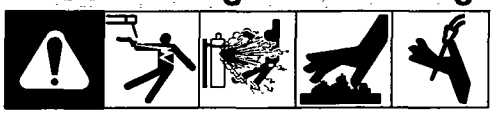
3.11 Gun Recommendation Table

Process	Gun
GMAW-P – Hard or Cored Wires	GW-500 Or GW-600
GMAW – Hard or Cored Wires	M25, M40, Or GA-50C
FCAW – Self-Shielding Wires	GA-40GL Or GA-50GL

3.12 Wire Type, Size, and Feed Speed Capability Table

Motor Speed	Wire Type	Wire Size	Feed Speed Capability
Standard	All	.023 To 5/64 in (0.6 To 2 mm)	50 To 780 ipm (1.3 To 19.8 mpm)
Standard	All	3/32 To 7/64 in (2.4 To 2.8 mm)	50 To 700 ipm (1.3 To 17.8 mpm)
Standard	All	1/8 in (3.2 mm)	50 To 300 ipm (1.3 To 7.6 mpm)
Optional High Speed	All	.023 To 5/64 in (0.6 To 2 mm)	92 To 1440 ipm (2.3 To 35.6 mpm)

3.13 Installing and Threading Welding Wire



ST-152 648-A / Ref. ST-157 432 / Ref. ST-137 391-A / ST-142 597-A / Ref. S-0627-A / Ref. ST-150 922

☞ *Be sure that outlet cable has proper size liner for the welding wire size. When installing gun, position liner extending from outlet wire guide as close as possible to drive rolls without touching.*

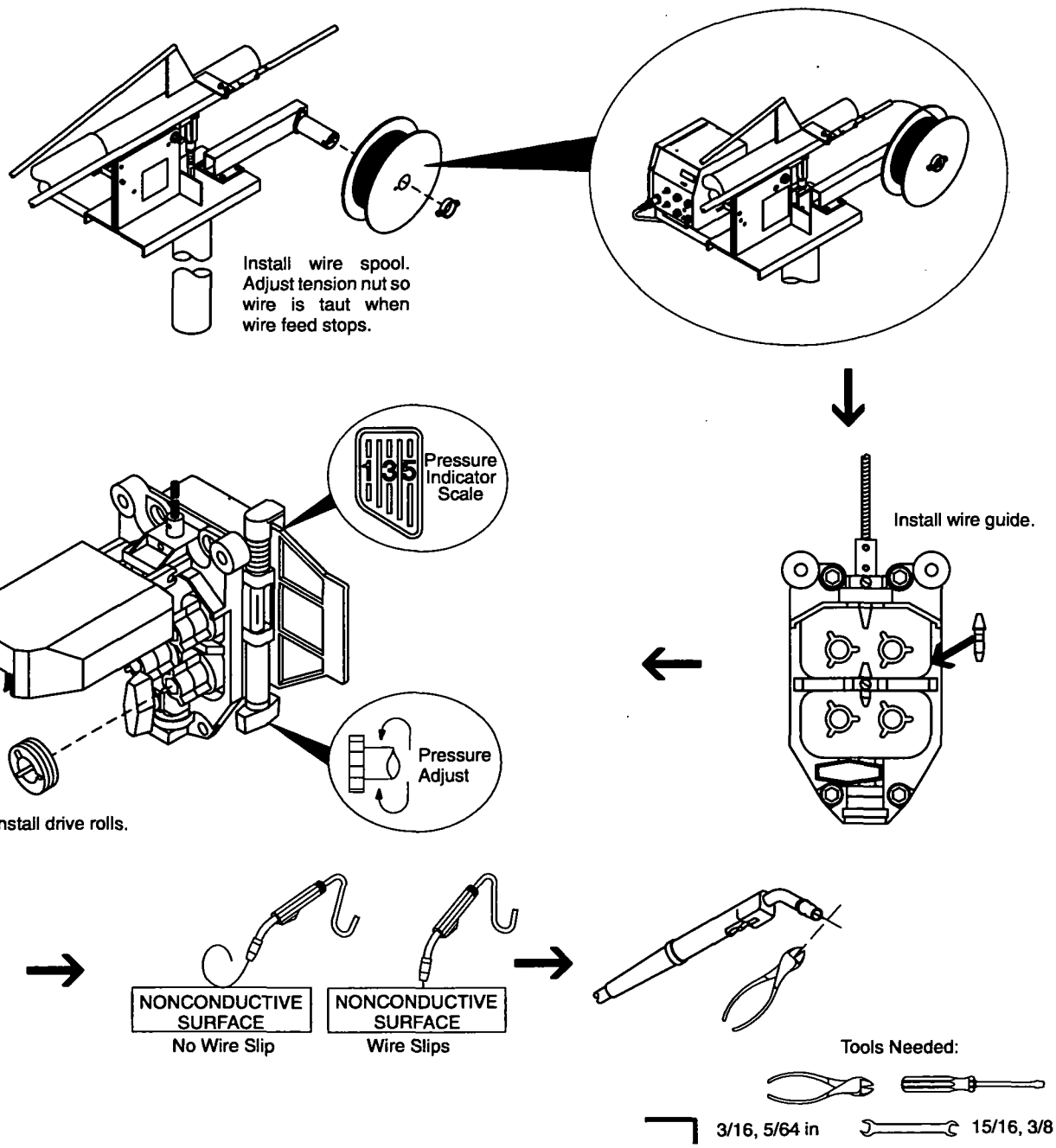
Install gun. Lay gun cable out straight. Cut off end of wire. Push wire through guides up to drive rolls; continue to hold wire. Press Jog button to feed wire out gun.

☞ *For soft wire or small diameter stainless steel wire, use 2 drive rolls and set drive roll pressure from 0 to a maximum of 4 on the pressure indicator scale (so that only the inner spring is compressed). This setting will generally give the best performance for these types of wires.*

To adjust drive roll pressure, hold nozzle about 2 in (51 mm) from nonconductive surface and press gun trigger to feed wire against surface. Tighten knob so wire does not slip. Do not overtighten. If contact tip is completely blocked, wire should slip at the feeder (see pressure adjustment above).

Cut wire off. Close cover.

Repeat for other side.



4. Operation

4.1 Operational Terms

Note ☞ *See Menu Guide for detailed programming steps.*

The following is a list of terms and their definitions as they apply to this wire feeder:

General Terms:

Adaptive Pulse Welding	The wire feeder automatically regulates pulse frequency to maintain a constant arc length, regardless of change in welding wire stickout.
Cold Wire Jog	When weld amperage is not present, wire feeds for about three seconds at set wire feed speed. Then the welding power source contactor deenergizes and wire continues to feed at the wire jog speed.
Inductance	As inductance increases, arc on time increases, and the weld puddle becomes more fluid.
Trim	Arc length adjustment in pulse welding. Increasing trim increases the actual arc length. Trim is replaced by volts in MIG programs.
Synergic	The operator programs pulse parameters for a specific wire feed speed. The wire feeder determines the pulse parameters between these wire feed speed increments.

Side Panel Terms:

Process Mode	Is used to select the type of process to be used, including Pulse, Adaptive Pulse, or Mig.
Sequence Mode	Is used to select and program the weld sequences which include weld, crater, burnback, postflow, preflow, and run-in.
Dual Schedule Mode	Is used to select a pair of programs that can be used together.
Card Mode	Is used to select use of the optional data card storage and retrieval capabilities.
Security Mode	Only functions with a data card. Allows using the lock feature for restricting range of program parameter changing.

4.2 Pulse Welding Terms

1 Apk = Peak Amperage

Increasing Apk increases penetration.

Vpk = Peak Voltage

Arc voltage during peak current phase of the pulse waveform. This determines arc length during adaptive pulse welding.

2 Abk = Background Amperage

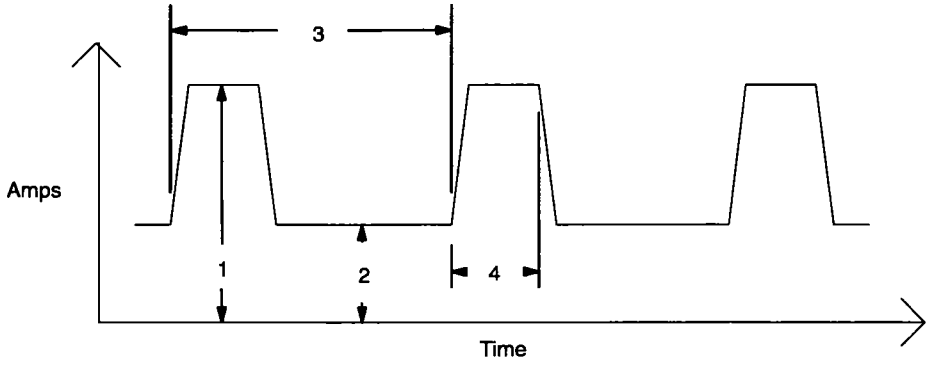
Maintains arc between pulses.

3 PPS = Pulses Per Second

Increasing PPS increases travel speed.

4 PWms = Pulse Width In Milliseconds

Increasing PWms increases bead width.



4.3 Front Panel Controls

Ref. ST-155 222

1 Display

2 Parameter Select Button

Press button to move > on display.

3 Display Control

Turn control to change value pointed to by >.

Turning control one click causes Trim (arc length) to increase/decrease by one or Volt to increase/decrease by 0.1.

When IPM is selected, turning control one click causes wire feed speed (IPM) to increase/decrease by one.

When MPM is selected, turning control three clicks causes wire feed speed (MPM) to increase by 0.1.

When Prg # is selected, turning control one click causes program number (Prg #) to increase/decrease by one.

The program number cannot be changed while welding, with exception of Dual Schedule Mode (see Section 6).

Pulse is a default setting. To change type of process (Pulse, Adaptive Pulse, or MIG) use side panel controls (see Section 4.4).

4 Trigger Hold Button And Indicator Light

Trigger Hold can be set on a per program basis. Indicator light comes on for programs where this feature is active.

To weld without holding gun trigger throughout weld cycle, press and release button to turn feature on (indicator light turns on).

To start weld cycle, press and release gun trigger within three seconds after an arc has been struck. To end weld cycle, press and release gun trigger.

5 Jog Button

Push to momentarily feed welding wire without energizing welding circuit or shielding gas valve.

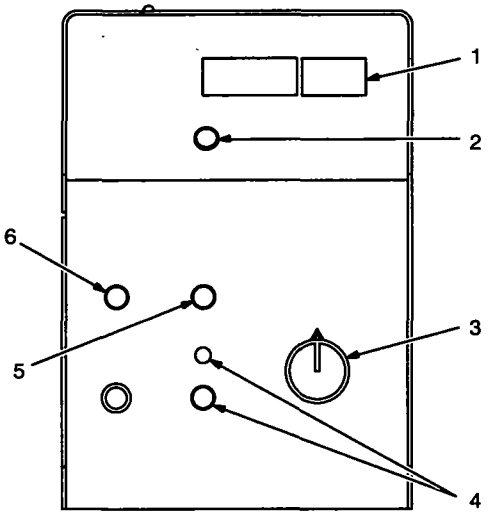
Jog speed is varied using the Display Control while Jog button is pressed. Default setting is 200 IPM.

6 Purge Button

Push to momentarily energize gas valve without energizing the welding circuit.

☞ *Jog and Purge only work on the active side of the feeder.*

Holding the Jog and Purge buttons at the same time displays pulse parameters on the side panel display and voltage on front panel display.



4.4 Side and Rear Panel Controls

Ref. ST-157 433-B / Ref. ST-155 223

1 Mode Display

2 Mode Select Button

Press button to move > in display.

3 Parameter Display

4 Parameter Select Button

Press button to move > in display.

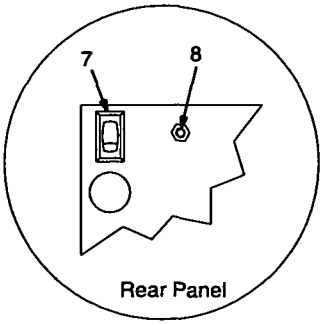
5 Parameter Increase Button

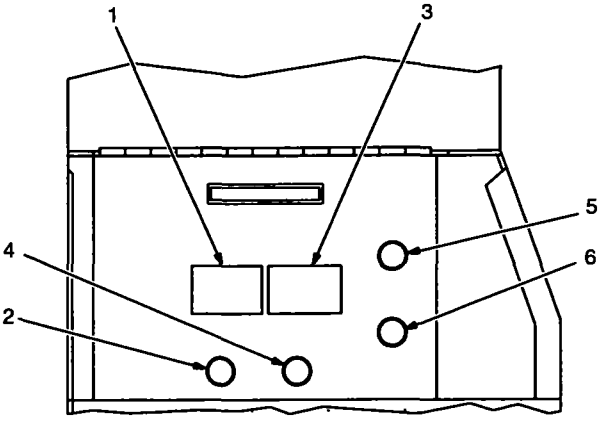
6 Parameter Decrease Button

7 Power Switch

8 Circuit Breaker CB1

CB1 protects the wire feeder from overload.





5. Setting Sequence Parameters

5.1 Setting Sequence Parameters in a Program

☞ *See Menu Guide for detailed programming steps.*

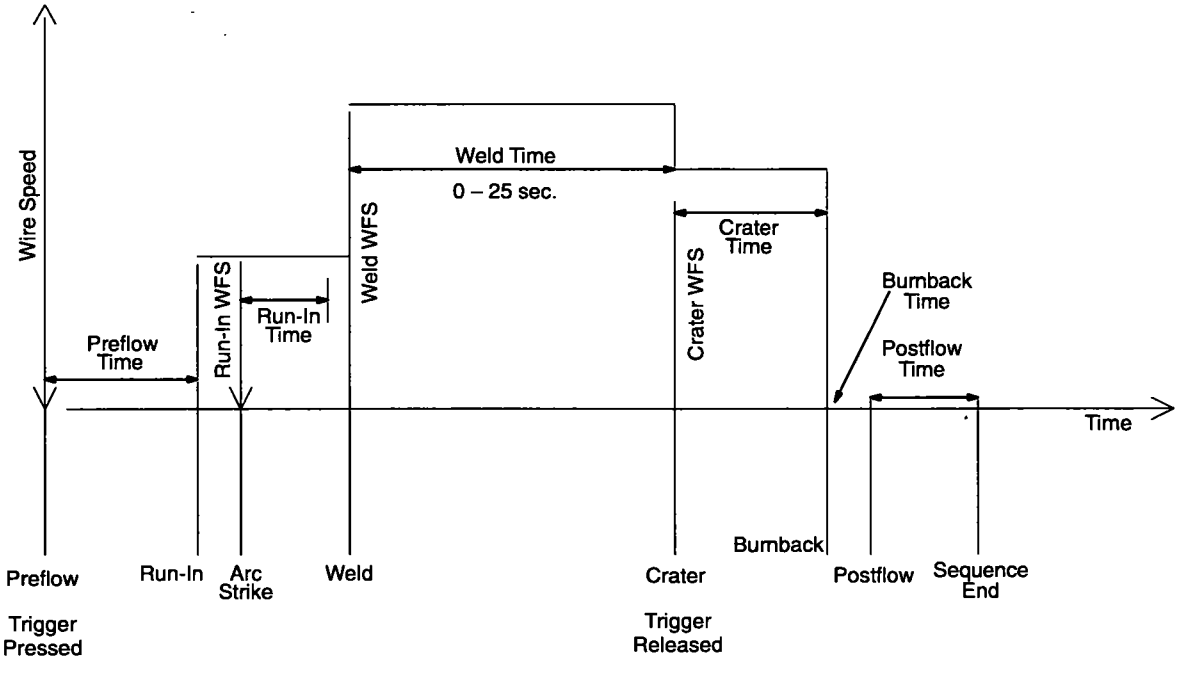
Trim is arc length. If set to zero, arc length is short. If set to 99, arc length is long.

If time is set to zero in Weld sequence, welding continues until gun trigger is released.

If time is set to zero in any timed sequence except Weld, the sequence is skipped.

		Trim 0-99	Volts 10.0-38.0	Inductance 0-99%	IPM 50-780	Seconds
1. Weld	Pulse	X			X	0-25.0
	MIG		X	X	X	
2. Crater	Pulse	X			X	0-2.50
	MIG		X		X	
3. Burnback	Pulse					0-0.25
	MIG		X			
4. & 5. Post-flow/Preflow						0-9.9
6. Run-In	Pulse	X			X	0-2.50
	MIG		X		X	

X = Setting available.



6. Setting Dual Schedule Parameters

6.1 Selecting Dual Schedule Pair

Dual Schedule is used with two consecutive weld programs 1 & 2, 3 & 4, 5 & 6, or 7 & 8. Any program type (MIG, Adaptive Pulse, or Pulse) can be combined in dual schedule.

1 Side Panel Display

Use side panel to turn feature on. See Menu Guide for detailed programming steps.

2 Front Panel Display

Press front panel parameter select button to select program number.

3 Front Panel Display Control

4 Dual Schedule Switch (See Section 6.2)

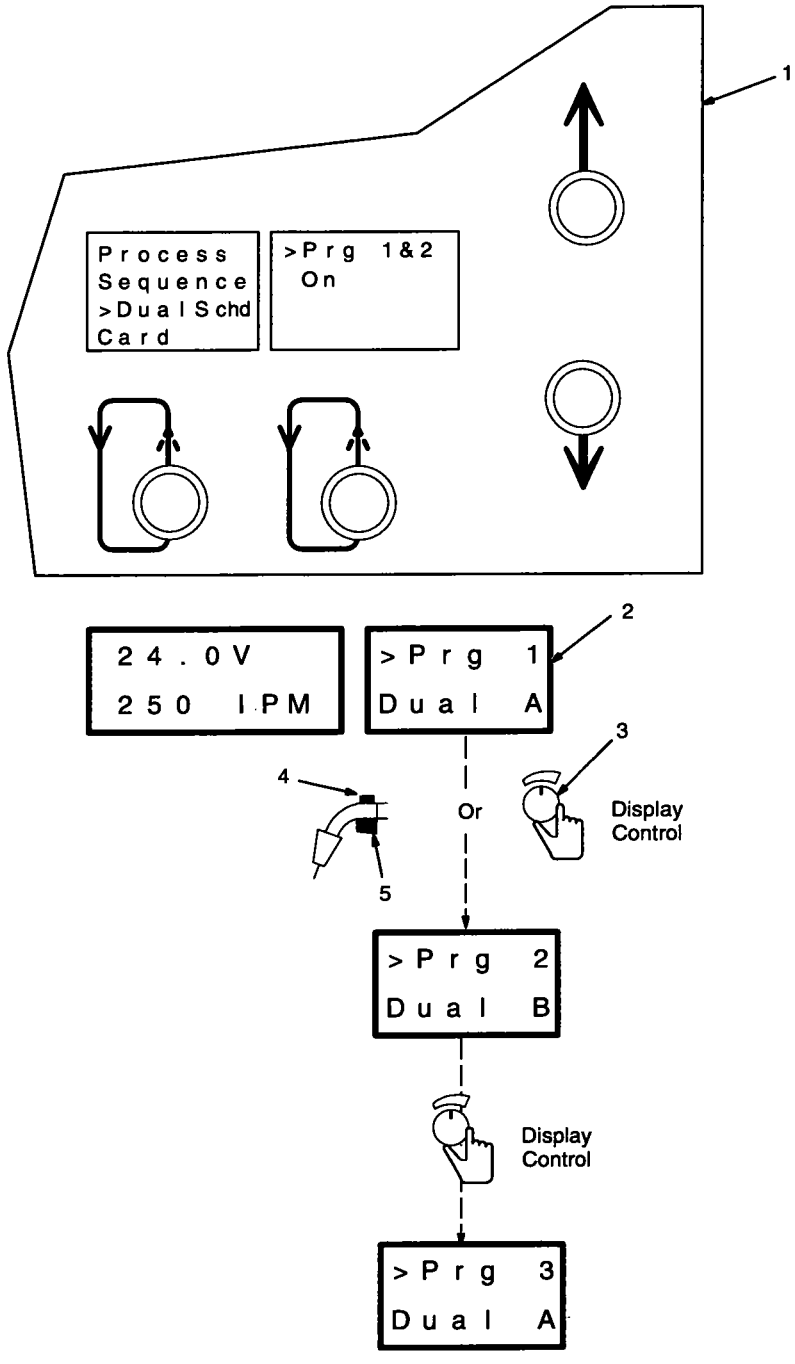
☞ *Switch type is set in System Setup. See Section 8.*

5 Welding Gun Trigger

Selecting dual schedule program A or B is done by using Display Control, dual schedule switch, or gun trigger (depending on system setup).

When program B is active, turn Display Control one click clockwise to select another pair of dual schedule programs.

☞ *Programs can be rearranged in desired order using the data card. See Section 7.*



6.2 Dual Schedule Switch Diagrams

1 Momen 2P (Momentary-Contact 2-Pole Switch Or DSS-10)

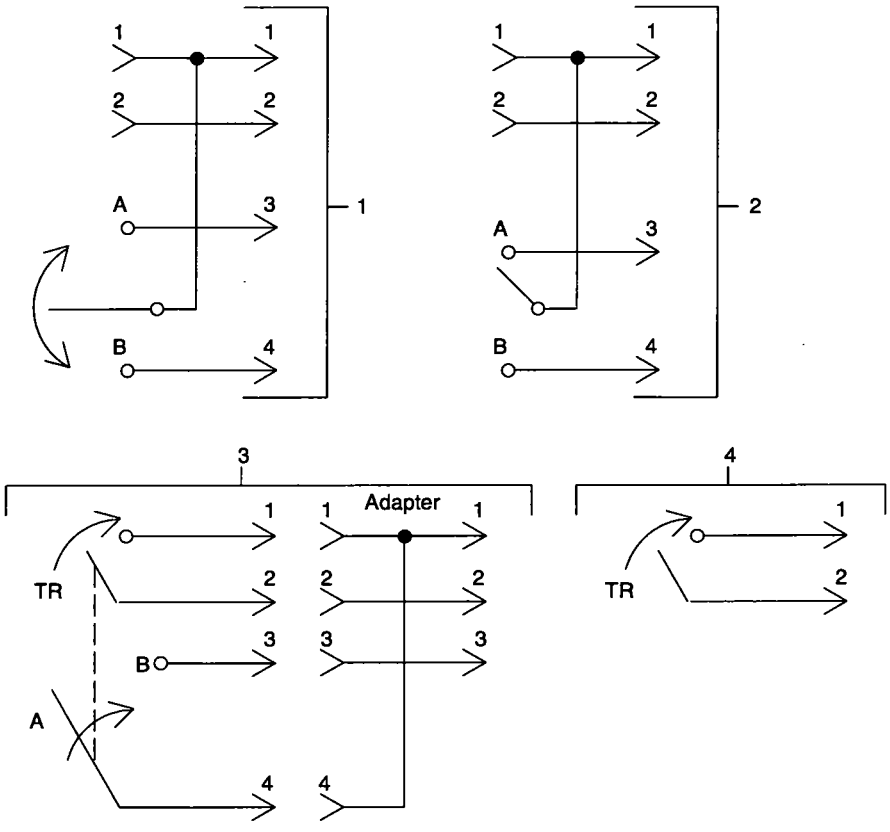
2 Maint 2P (Maintained-Contact 2-Pole Switch Or DSS-9M)

3 Maint 1P (Maintained-Contact 1-Pole Switch, Or DSS-8)

4 Trigger

Allows dual scheduling after establishing a welding arc.

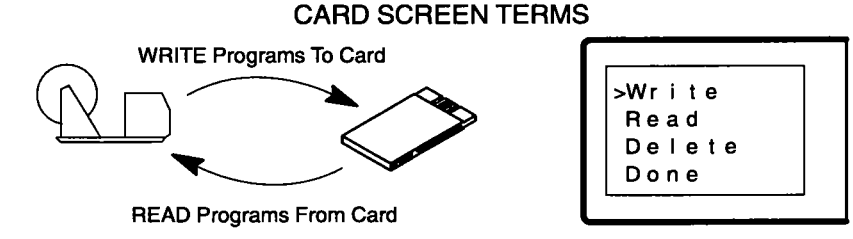
☞ *If trigger is used for dual schedule switch, Trigger Hold is disabled.*

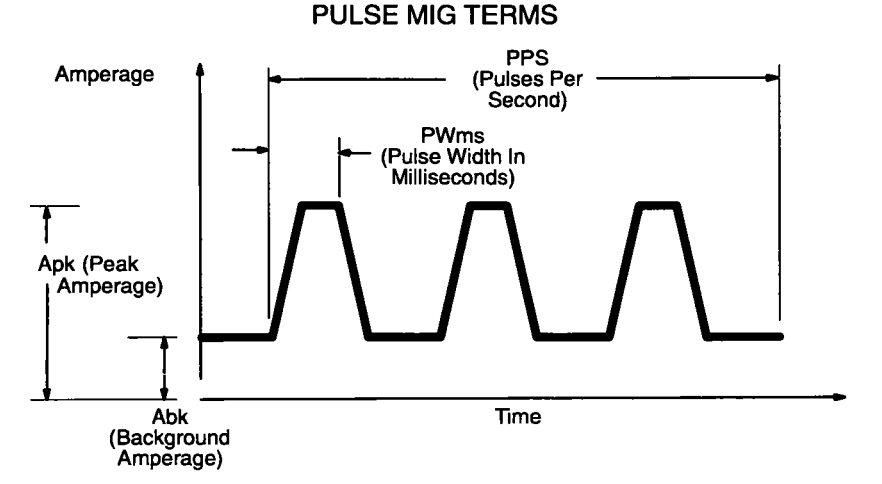


7. Using the Optional Data Card

7.1 Data Card Terms

SA-158 435





7.2 Installing Data Card

1 Label

Apply label to data card. Write program information on label.

2 Data Card

3 Card Slot

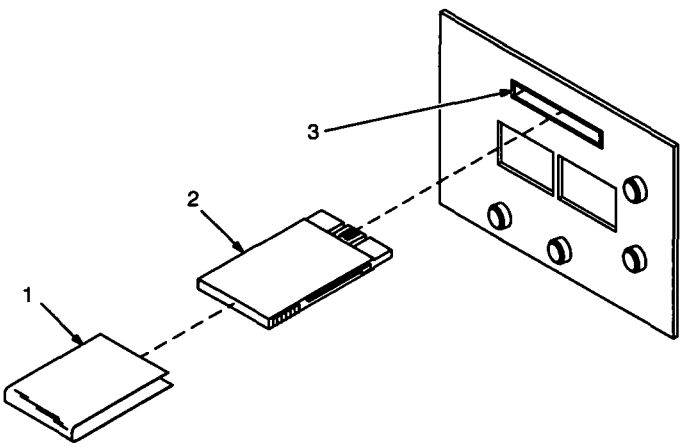
For Blank Data Card:

Insert card into slot. To format card, turn On power. Select Card from menu. Data card formats when unit enters Card mode.

For Power Source Data Card:

Insert card into slot. Turn On power. Push Parameter Select button within 3 seconds and the 8 programs and setup information are read into the wire feeder memory.

Unit is ready to use when "Please Wait" message disappears from front panel display.



7.3 Card Displays

☞ *See Menu Guide for detailed programming steps. Security mode only functions with a data card.*

1 Card Display

2 Moving Line

Moving line is under value that can be changed.

3 Write

Transfers program data from unit to card. The program card can hold up to 32 programs. When writing to the card, the next available program number is automatically assigned.

4 Read

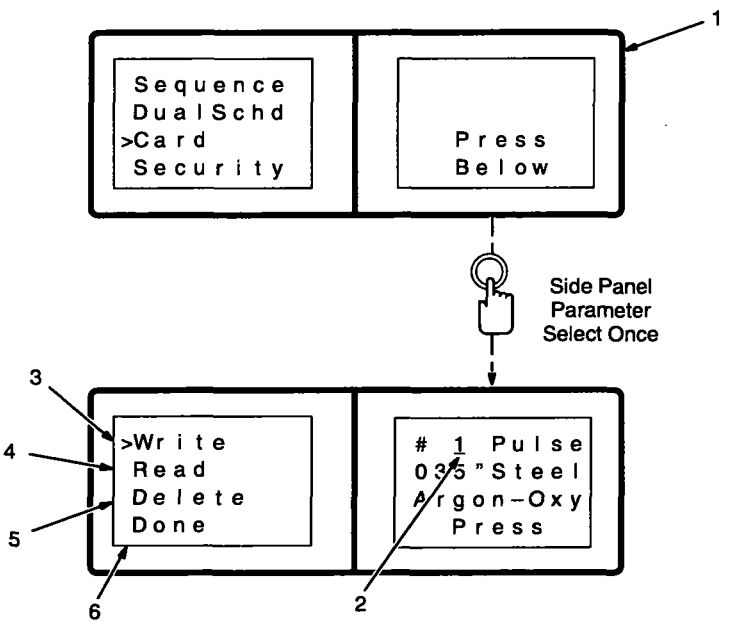
Transfers program data from card to unit.

5 Delete

Deletes program data from card.

6 Done

Exits card display.



8. System Setup

8.1 Display Settings

Note ☞ *See Menu Guide for detailed programming steps.*

DISPLAY SETTING	NOTES
>System *	Select the process the welding power source is able to do.
>Range *	Welding power source minimum and maximum voltage values are always needed. Amperage values are required for pulse welding. Set values to match welding power source ranges.
>Access♦	When on, restricts use of setup screens.
>Mig Type	Default is Off. Set to On only for older CV welding power source without voltage feedback at 14-socket receptacle.
>Voltage	Default is 14-pin receptacle. Use V. Sense when more than 50 ft (15m) of weld cable is used (including gun cable length).
>Arc Start**	Use Hot Start only with 450 Ampere Inverter Model welding power source and large diameter wires. The arc starts in CV and switches to CC.
>Dual Schedule	See Section 6.2.
>Trigger	When on, trigger can be used to switch between programs that have at least 0.2 seconds of preflow time programmed.
>Remote	When on, a DSS-10 can be used to change Volts or Trim, IPM, or Prg depending on where the front panel display > is.
>Arc Time	Displays accumulated arc time and cycles.
>Wire Feed	Choose to display inches per minute or meters per minute and motor type, but installed motor must match selection.
>Model**	Pulse programs differ between bench and boom models.
>Memory	Program Reset: unit defaults to original factory setting for the last active program. Setup information does not change. If setup card is in card slot, program will be loaded from card. System Reset: unit defaults to original factory settings for all programs and setup excluding System, Arc Time, and Model. If setup card is in card slot, program will be loaded from card.
>Shutdown	When on, the system immediately shuts down if no arc voltage is sensed. When off, wire feeds even if no arc voltage is sensed.
>Teach	Default is 15 points, but can be set to 4 points.
>Gas Flow♦♦	Setting must be Meter Off if option is not installed.
>Software	Know this when talking with service personnel.

* Automatically set if power source data card is used.
♦ Can be used only when optional data card is inserted.
** Selection does not appear on display when MIG Only is System choice.
♦♦ Must remain set to Meter Off if option is not installed to prevent system error.

9. Standard Pulse Welding Programs

Note ☞ Apk = Peak Amperage, Vpk = Peak Voltage, Abk = Background Amperage, PPS = Pulses Per Second, PWms = Pulse Width (milliseconds). Four teach points were used for factory set programs. If selection is set for fifteen teach points, the remaining points are interpolations from the 4 taught points.

9.1 Program 1 – Steel

Wire Size/Type: .035" **Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
700 / 17.8	440	367	160	180	2.9	
400 / 10.2	385	324	108	126	2.3	
200 / 5.1	335	287	61	81	2.0	
100 / 2.5	328	274	37	47	1.7	

9.2 Program 2 – Steel

Wire Size/Type: .045" **Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
700 / 17.8	518	376	195	205	3.6	
400 / 10.2	476	361	157	168	3.0	
200 / 5.1	412	303	93	106	2.4	
100 / 2.5	375	277	50	66	2.2	

9.3 Program 3 – Steel

Wire Size/Type: .052" **Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
625 / 15.9	560	393	200	229	3.6	
400 / 10.2	525	362	148	189	3.5	
200 / 5.1	475	317	102	131	2.7	
100 / 2.5	445	296	50	80	2.4	

9.4 Program 4 – Steel

Wire Size/Type: .062" **Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
400 / 10.2	580	366	200	200	4.3	
300 / 7.6	539	348	160	200	4.2	
200 / 5.1	499	315	121	170	3.6	
100 / 2.5	460	283	69	118	2.6	

9.5 Program 5 – Stainless

Wire Size/Type: .035" **Gas: Ar - He - CO_2 / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
700 / 17.8	403	339	132	191	2.8	
400 / 10.2	318	316	87	146	2.4	
200 / 5.1	295	285	53	94	1.9	
100 / 2.5	280	260	32	45	1.8	

9.6 Program 6 – Stainless

Wire Size/Type: .045" **Gas: Ar - He - CO_2 / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
700 / 17.8	480	390	200	227	3.2	
400 / 10.2	425	324	155	185	2.5	
200 / 5.1	360	280	100	115	2.0	
100 / 2.5	350	262	40	70	2.0	

9.7 Program 7 – Nickel Alloy

Wire Size/Type: .035" Nickel Alloy **Gas: Ar - He / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
700 / 17.8	350	345	130	144	3.7	
400 / 10.2	310	300	80	105	3.3	
200 / 5.1	280	275	48	55	2.9	
100 / 2.5	260	251	28	36	2.5	

9.8 Program 8 – Silicon Bronze

Wire Size/Type: .035" SiBr **Gas: Argon / 40 CFH (19 L/m)**

IPM / MPM	Apk	Vpk	Abk	PPS	PWms	COMMENTS
510 / 13.0	340	307	100	125	3.7	
400 / 10.2	310	298	83	97	3.4	
200 / 5.1	277	266	48	55	3.0	
120 / 3.1	242	252	31	31	3.0	

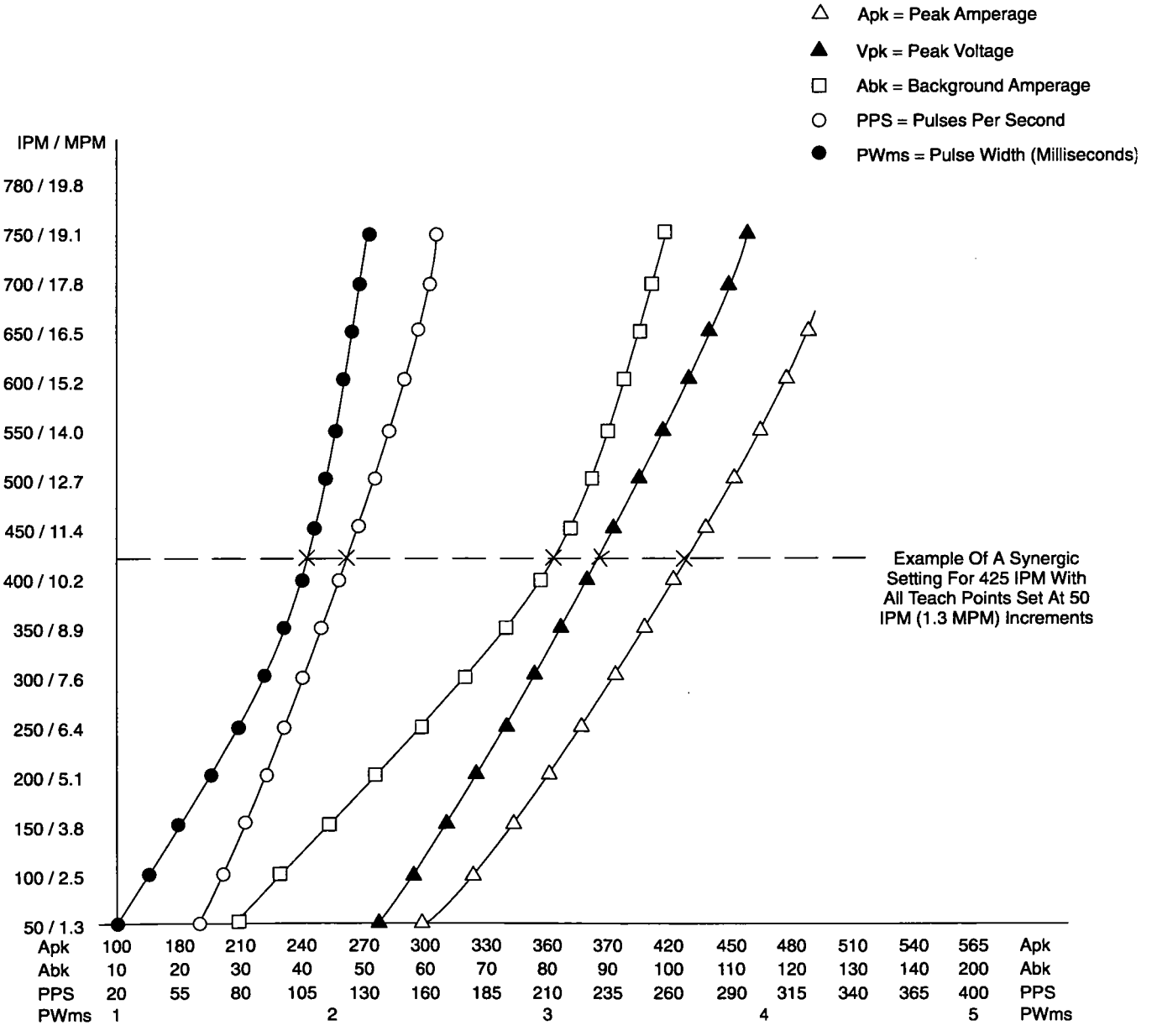
10. Teach Points

10.1 Teach Using 15 Points

The teach mode allows the user to create custom pulse programs. The teach mode selection for 15 teach points gives a more defined curve for a specific range. At each teach point, the user can adjust five parameters to shape the pulse waveform of the weld output. The six parameters are: IPM (MPM), Apk, Vpk, Abk, PPS, and PWms.

Apk, Vpk, Abk, PPS, and PWms acting together provide the energy necessary to burn off welding wire at a set wire feed speed. The graph below shows that as wire feed speed increases, energy increases (Apk, Vpk, Abk, PPS, and PWms acting synergically).

Under some conditions, the wire feeder limits wire feed speed to maintain all pulse parameters within the capability of the system.

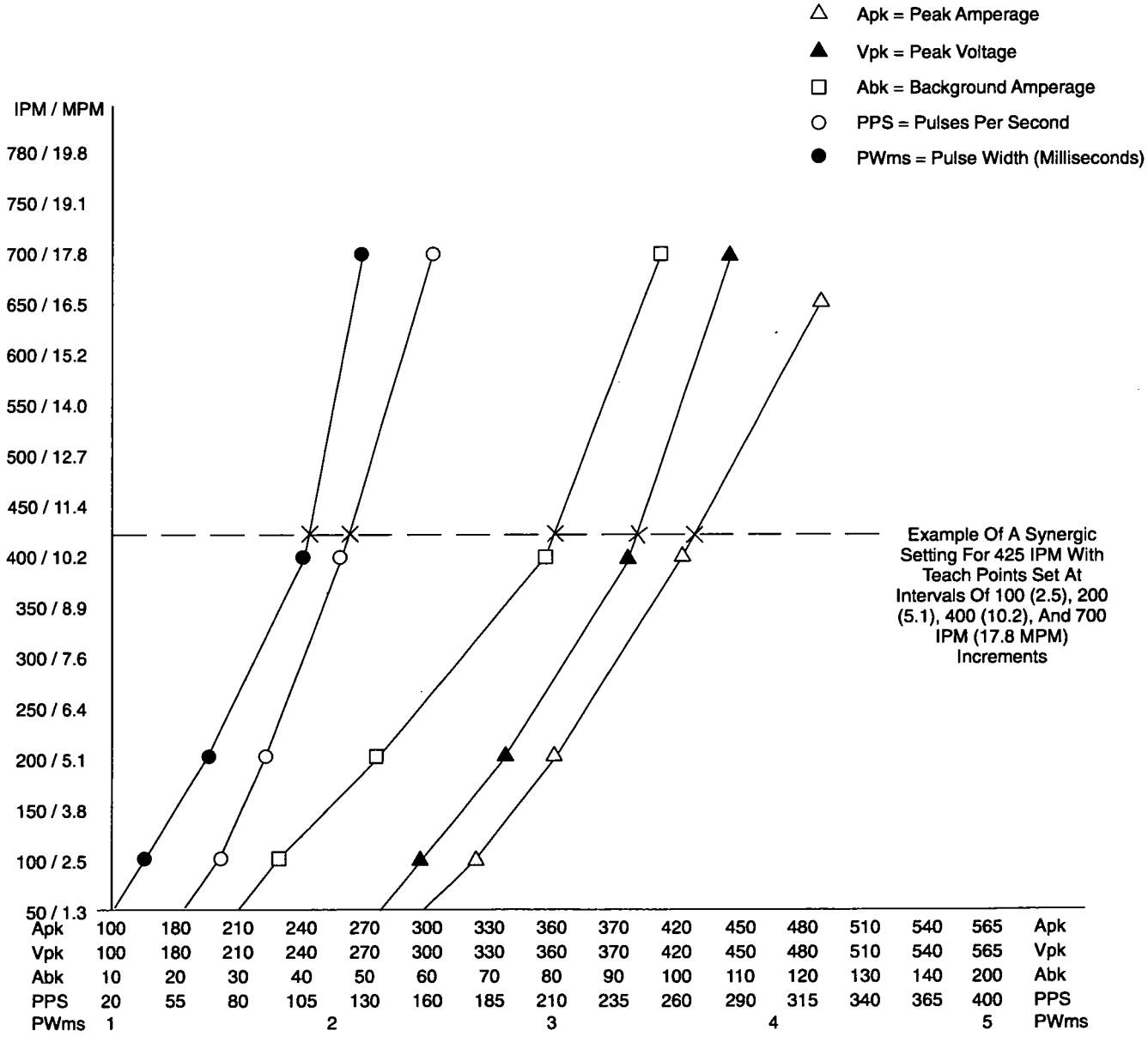


10.2 Teach Using 4 Points

The teach mode allows the user to create custom pulse programs. The teach mode selection for 4 teach points gives the whole welding range quickly. At each teach point, the user can adjust five parameters to shape the pulse waveform of the weld output. The six parameters are: IPM (MPM), Apk, Vpk, Abk, PPS, and PWms.

Apk, Vpk, Abk, PPS, and PWms acting together provide the energy necessary to burn off welding wire at a set wire feed speed. The graph below shows that as wire feed speed increases, energy increases (Apk, Vpk, Abk, PPS, and PWms acting synergically).

Under some conditions, the wire feeder limits wire feed speed to maintain all pulse parameters within the capability of the system.



10.3 Redefining Teach Points

Ref. S-0259 / Ref. ST-154 109

1 IPM

IPM determines the weld metal deposition rate.

☞ *Redefining IPM is not normally required unless special wire or unusual joint design is needed.*

Use front panel parameter select button to move > to select IPM. Use Display Control to select teach point value.

Press and hold Purge button while turning Display Control to redefine the ipm teach point. For example: there are teach points at 150, 200, and 250 ipm; the teach point at 200 can be adjusted to a wire feed speed of 151 to 249 ipm.

2 Apk – Peak Amperage

3 Abk – Background Amperage

Peak and background amperage depend on the range of the welding power source.

4 PPS – Pulses Per Second Of 20-400

5 PWms – Pulse Width Of 1.0-5.0 Milliseconds

Use side panel controls to change pulse parameters. See Menu Guide for detailed programming steps.

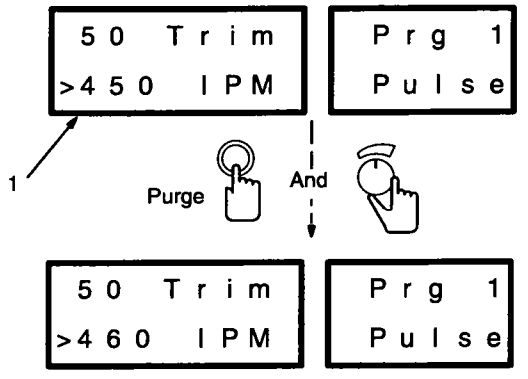
After values are set, strike and maintain an arc for five seconds. Do this for each teach point.

End weld by releasing gun trigger, not by pulling gun out of weld. Repeat for each custom teach point.

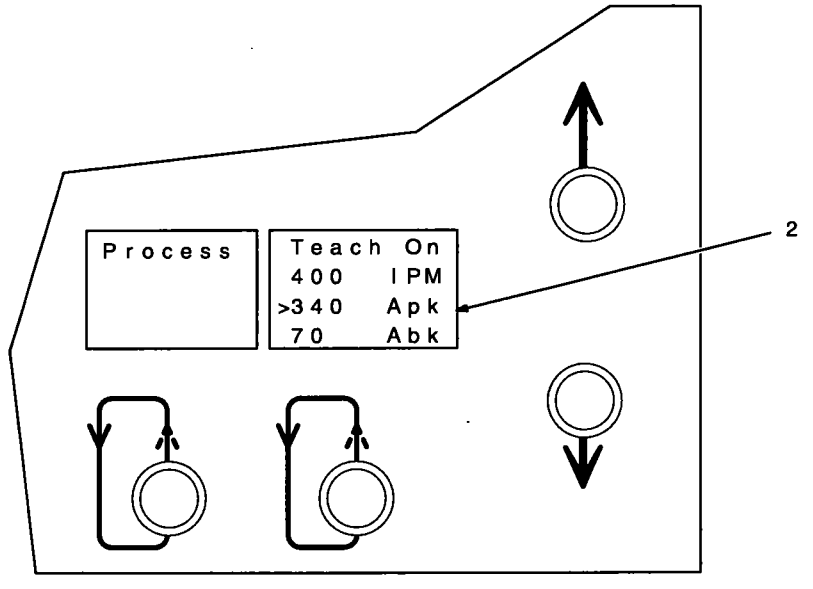
The taught arc length represents a Trim (arc length) setting of 50.

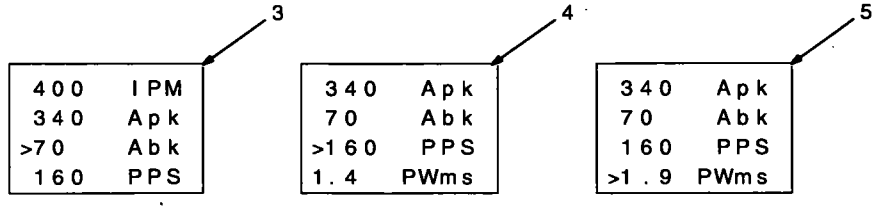
Once the teach points are set, the wire feeder adjusts parameters between teach points synergically.

Redefining IPM Teach Point



Redefining Pulse Parameters





Date_____ Program Number_____ Wire Size/Type_____

Gas_____ Flowrate_____CFH(L/min)

Equipment Used – Power Source____ Serial Number_____

Wire Feeder_____ Serial Number_____

Gun Model_____ Weld Cable – Negative_____ Positive_____

Wire Manufacturer_____ Mfg. Date_____

IPM / MPM	Apk	Abk	PPS	PWms	Vpk	COMMENTS

Preflow Seconds:_____

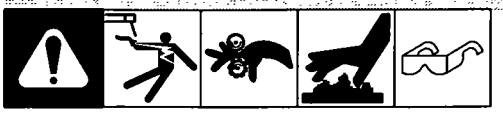
Run-In Trim/Volts:_____ IPM / MPM:_____ Seconds:_____

Crater Volts:_____ IPM / MPM:_____ Seconds:_____

Postflow Seconds:_____

11. Maintenance and Troubleshooting

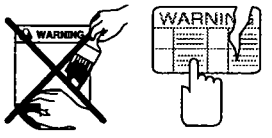
11.1 Routine Maintenance



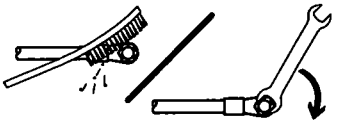
▲ **Disconnect power before maintaining.**

3 Months

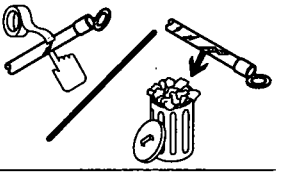
Replace Unreadable Labels



Clean And Tighten Weld Terminals

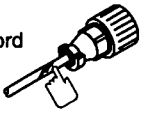


Repair Or Replace Cracked Weld Cable



Replace Cracked Parts

14-Pin Cord



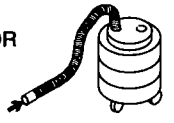
Gas Hose And Fittings

Gun Cable

6 Months

Blow Out Or Vacuum Inside. During Heavy Service, Clean Monthly

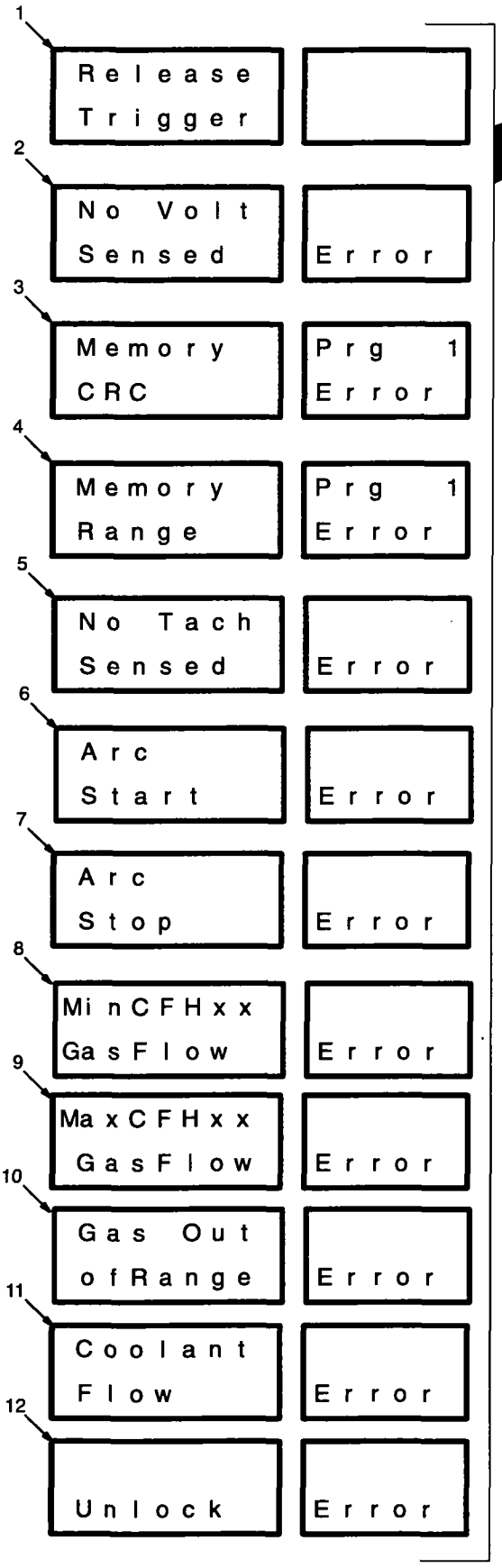
OR

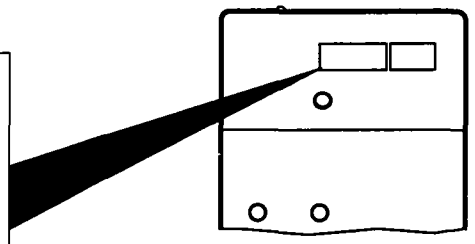


Clean Drive Rolls

11.2 Error Displays

Ref. ST-155 222





1 Release Trigger Error Display

This appears if the trigger is closed when the unit power is turned on, or if the trigger is stuck or defective.

2 No Volt Sensed Error Display

The arc voltage sense circuit is not receiving feedback. Check voltage sensing connections. Check connections at 14-position plugs/ receptacles at the unit and welding power source.

Turn unit off and back on after correcting problem.

If this error continues to occur when pulse welding, it may help to select Hot Start.

3 Memory CRC Error Display

The data in the program indicated is not the same data that was saved.

Perform a system reset.

4 Memory Range Error Display

The data in the program indicated is out of usable range.

Go through pulse parameters to make sure they do not exceed settings of the Range display or perform a system reset.

5 No Tach Sensed Error Display

The motor tach feedback is not reaching the control. Check connections.

Press front panel Parameter Select to clear error.

6 *Arc Start Error Display*

This appears when pulse welding and current is detected but the arc cannot be started. Check and correct program pulse parameters and voltage settings. Check voltage sensing connections.

Press front panel Parameter Select to clear error.

7 Arc Stop Error Display

This appears when pulse welding and the motor does not stop at the end of the weld. If there is high frequency being used in the area, turn it off. A motor brake circuit problem can also cause this error.

Press front panel Parameter Select to clear error.

8 *Minimum Gas Flow Error*

This appears when gas flow falls below the minimum CFH set (xx in example). Adjust gas flow to bring it above set value.

Press front panel Parameter Select to clear error.

9 Maximum Gas Flow Error

This appears when gas flow is above the maximum CFH set (xx in example). Adjust gas flow to bring it below set value.

Press front panel Parameter Select to clear error.

10 Gas Out Of Range Error

This appears when gas flow is greater than 100 CFH. To protect the internal sensor, the unit shuts down until the gas flow can be *adjusted below 100 CFH.*

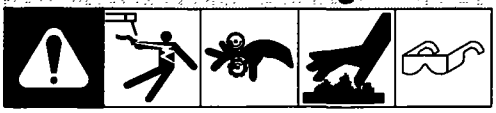
11 Coolant Flow Error

This appears only when coolant flow switch option is installed. Check coolant recirculating system.

12 *Unlock Error Display*

This appears when attempting to run an unlocked program while other programs are locked. Either lock the unlocked program or select a different program that is locked.

11.3 Troubleshooting

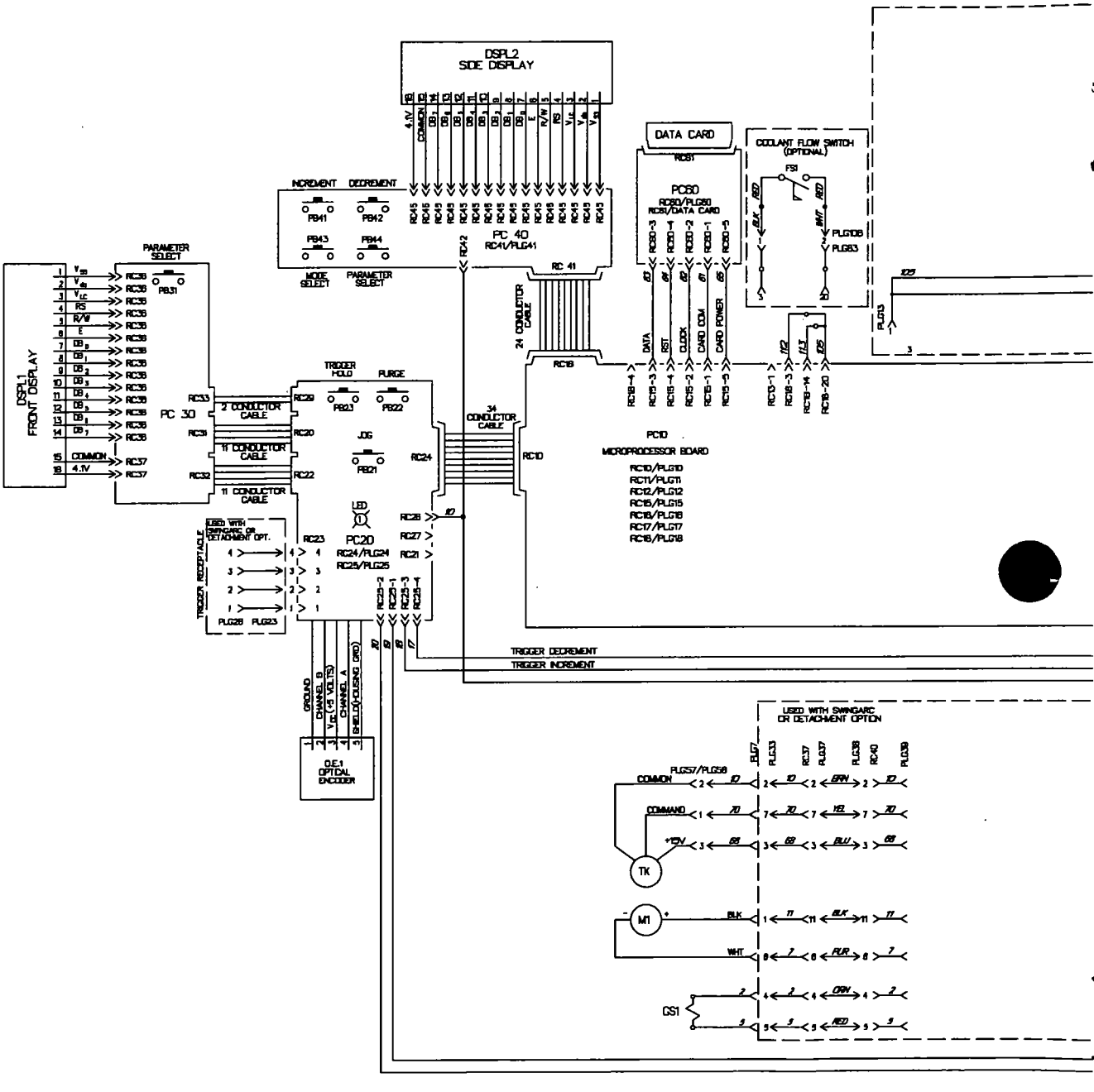


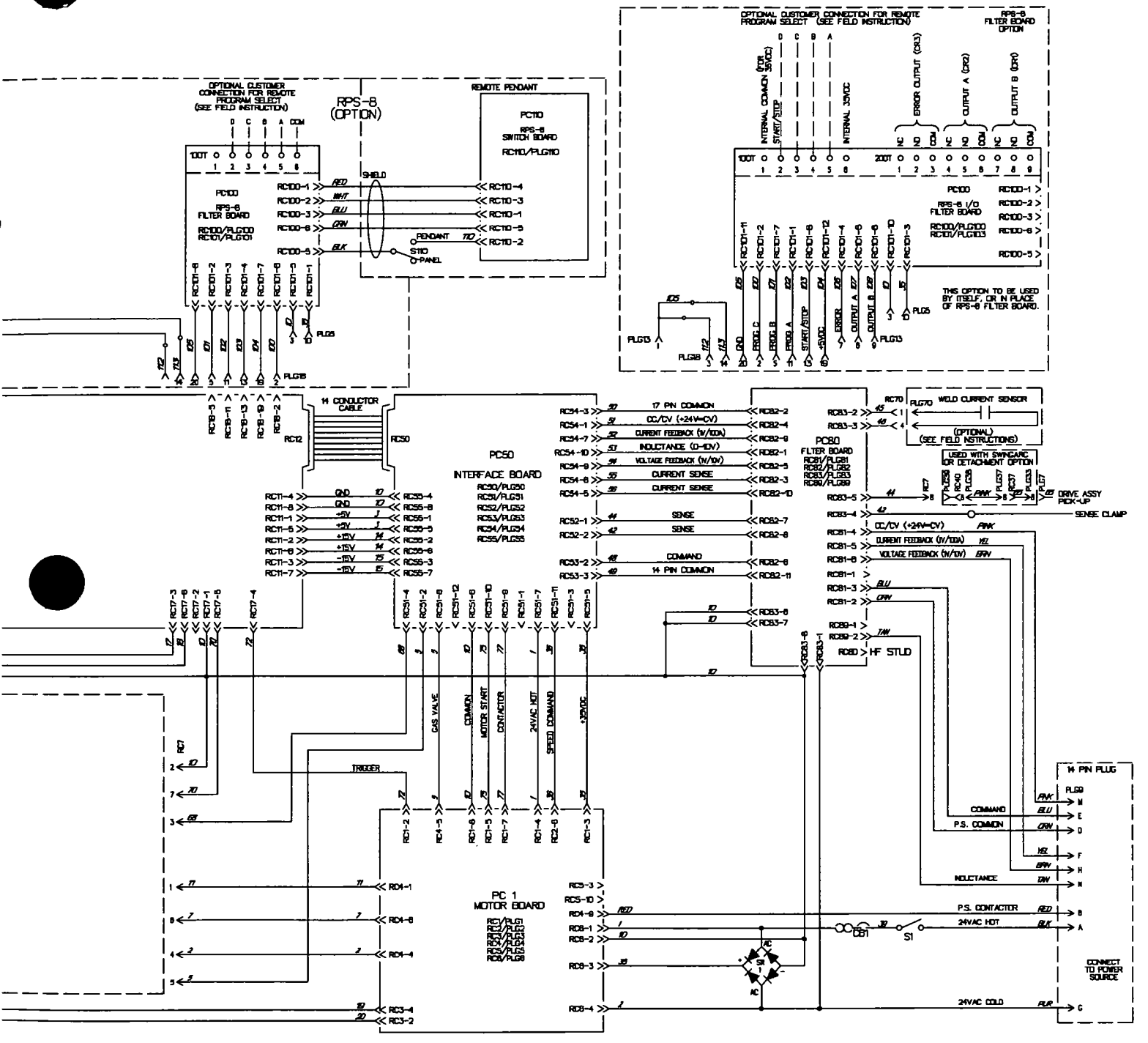
▲ **Disconnect power before troubleshooting**

Trouble	Remedy
Wire feeds, shielding gas flows, but electrode wire is not energized.	Check interconnecting cord connections. If secure, check cord for continuity and repair or replace (see Sections 3.5 and 3.7).
Wire feeder is on, meter(s) do not light up, motor does not run, gas valve and welding power source contactor do not pull in.	Check and reset CB1 (see Section 4.4).
Electrode wire feeding stops or feeds erratically during welding.	Check gun trigger connection. See gun Owner's Manual.
	Check gun trigger. See gun Owner's Manual.
	Readjust hub tension and drive roll pressure (see Section 3.13).
	Change to correct size drive roll (see Section 13.6).
	Clean or replace dirty or worn drive roll.
	Incorrect size or worn wire guides.
	Replace contact tip or liner. See gun Owner's Manual.
	Remove weld spatter or foreign matter from around nozzle opening.
	Have Factory Authorized Service Agency check drive motor or motor control board PC1.
Motor runs slowly.	Check for correct input voltage.
Wire does not feed until trigger is pulled, but continues to feed after trigger is released, and trigger hold is not on.	Check for a short between welding gun trigger leads and weld cable. Repair short or replace welding gun.
Gas valve in feeder is rattling loudly along with possible erratic or slow wire feed speed.	Check for a short between welding gun trigger leads and weld cable. Repair short or replace welding gun.
Unit does not switch out of Run-In Speed.	Install, reconnect, or replace voltage sensing lead.
Wire feeder power is on, displays light up, but unit is inoperative.	Check welding gun trigger leads for continuity, and repair leads or replace gun.

12. Electrical Diagram

12.1 Circuit Diagram



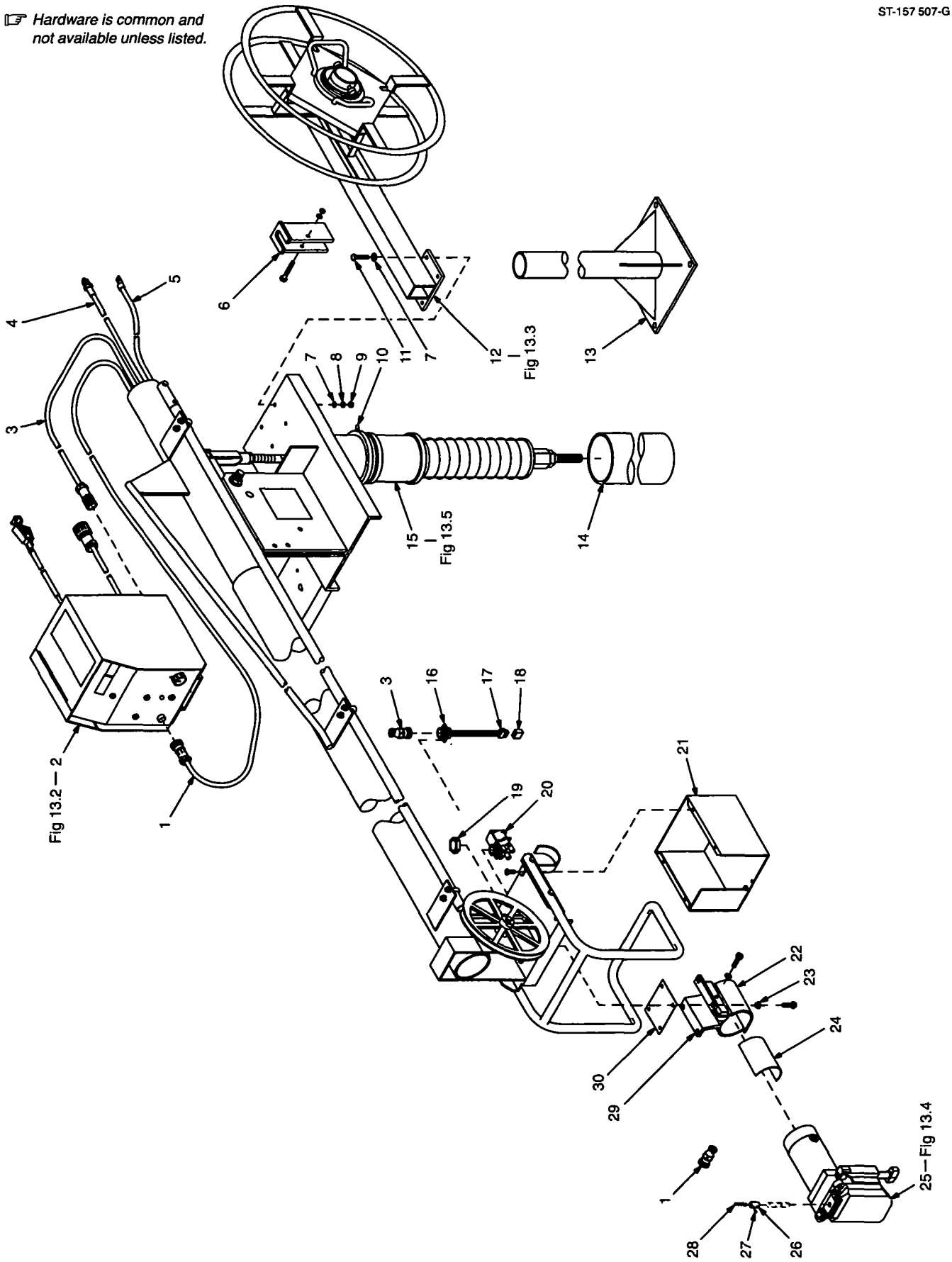

OPTIONAL CUSTOMER CONNECTION FOR REMOTE PROGRAM SELECT (SEE FIELD INSTRUCTION)
RPS-8 (OPTION)
REMOTE PENDANT
PC110
RPS-8 SWITCH BOARD
RC110/PLG110
PC100
RPS-8 FILTER BOARD
RC100/PLG100
RC101/PLG101
SHIELD
PENDANT
STIC
D-PANEL
PLG15
PLG5
OPTIONAL CUSTOMER CONNECTION FOR REMOTE PROGRAM SELECT (SEE FIELD INSTRUCTION)
RPS-8 FILTER BOARD OPTION
INTERNAL COMMON (FOR 35VDC)
START/STOP
INTERNAL 35VDC
ERROR OUTPUT (CR3)
OUTPUT A (CR2)
OUTPUT B (CR1)
PC100
RPS-8 I/O FILTER BOARD
RC100/PLG100
RC101/PLG103
THIS OPTION TO BE USED BY ITSELF, OR IN PLACE OF RPS-8 FILTER BOARD.
PLG13
PLG5
PLG38
14 CONDUCTOR CABLE
RC12
RC50
PC50
INTERFACE BOARD
RC50/PLG50
RC51/PLG51
RC52/PLG52
RC53/PLG53
RC54/PLG54
RC55/PLG55
17 PIN COMMON
CC/CV (+24V=CV)
CURRENT FEEDBACK (V/100A)
INDUCTANCE (0-10V)
VOLTAGE FEEDBACK (V/10V)
CURRENT SENSE
CURRENT SENSE
SENSE
SENSE
COMMAND
14 PIN COMMON
PC80
FILTER BOARD
RC80/PLG80
RC81/PLG81
RC82/PLG82
RC83/PLG83
RC89/PLG89
WELD CURRENT SENSOR
PLG70
(OPTIONAL)
(SEE FIELD INSTRUCTIONS)
USED WITH SWINGARC OR DETACHMENT OPTION
DRIVE ASSY PICK-UP
SENSE CLAMP
CC/CV (+24V=CV)
CURRENT FEEDBACK (V/100A)
VOLTAGE FEEDBACK (V/10V)
HF STUD
GAS VALVE
COMMON
MOTOR START
CONTACTOR
24VAC HOT
SPEED COMMAND
+35VDC
TRIGGER
PC 1
MOTOR BOARD
RC1/PLG1
RC3/PLG3
RC4/PLG4
RC5/PLG5
RC6/PLG6
RC8/PLG8
14 PIN PLUG
PLG9
COMMAND
P.S. COMMON
INDUCTANCE
P.S. CONTACTOR
24VAC HOT
24VAC COLD
CB1
S1
CONNECT TO POWER SOURCE

13. Parts List

13.1 Main Assembly

☞ *Hardware is common and not available unless listed.*

ST-157 507-G



Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 12	16
1		149 251	CABLE, trigger (consisting of)	1	
1		149 252	CABLE, trigger (consisting of)		1
	PLG23	079 878	CONNECTOR & PINS	1	1
		079 531	CONNECTOR, circ clamp str rlf sz 11 Amp 206358-2	2	2
		605 156	CABLE, port No. 18 4/c (order by ft)	17ft	21ft
	PLG28	080 328	CONNECTOR w/SOCKETS, free hanging	1	1
2		See Note	CONTROL BOX, (Fig 13.2)	1	1
3		164 475	CABLE, interconnecting (consisting of)	1	
3		164 474	CABLE, interconnecting (consisting of)		1
	PLG37,38	047 636	CONNECTOR & PINS	2	2
		079 739	CONNECTOR, circ clamp str rlf sz 17-20 Amp 206322-2	2	2
		163 519	CABLE, port No. 18/14 8/c (order by ft)	17ft	21ft
4		139 600	HOSE, gas (consisting of)	1	
4		139 599	HOSE, gas (consisting of)		1
		010 603	FITTING, hose brs barbed nipple 1/4tbg	2	2
		010 606	FITTING, hose brs nut .625-18RH	2	2
		603 106	HOSE, nprn brd No. 1 x .250 ID (order by ft)	26ft	30ft
		056 112	FITTING, hose brs ferrule .475 ID x .718 lg	2	2
5		600 324	CABLE, weld cop strd No. 4/0 (order by ft)	26ft	30ft
6		149 884	BRACKET, spring retaining	1	
6		080 947	BRACKET, spring retaining		1
7		602 243	WASHER, flat stl std .375	8	8
8		602 213	WASHER, lock stl split .375	4	4
9		601 872	NUT, stl hex full .375-16	4	4
10		080 157	FITTING, grease 1/8NPT	1	1
11		132 053	SCREW, cap stl hexhd .375-16 x 1.500 lg	4	4
12		Fig 13.3	SUPPORT, hub & reel	1	1
13		♦149 838	PIPE POST, 4ft w/base or	1	
13		♦149 839	PIPE POST, 6ft w/base	1	
13		♦078 264	PIPE POST, 4ft w/base or		1
13		♦079 216	PIPE POST, 6ft w/base		1
14		♦075 078	PIPE POST, 4ft w/o base or	1	1
14		♦079 217	PIPE POST, 6ft w/o base	1	1
15		Fig 13.5	BOOM ASSEMBLY	1	1
16	RC37	047 637	CONNECTOR & SOCKETS	1	1
17	PLG33	135 409	CONNECTOR & PINS	1	1
18	PLG7	115 092	CONNECTOR & SOCKETS	1	1
19		605 227	NUT, nyl hex jam .750NPST	1	1
20	GS1	125 785	VALVE, 24VAC 2 way custom port 1/8 orf	1	1
21		139 265	COVER, motor & components	1	1
22		156 243	CLAMP, motor top	1	1
23		159 360	INSULATOR, screw machine	4	4
24		145 639	STRIP, buna N compressed sheet .062 x 4.000sq	1	1
25		167 774	DRIVE ASSEMBLY, wire (Fig 13.4)	1	1
25		♦167 776	DRIVE ASSEMBLY, wire (high speed) (Fig 13.4)	1	1
26		157 295	GUIDE, monocoil	1	1
27		604 612	SCREW, set stl sch 8-32 x .125 cup point	2	2
28		082 050	LINER, monocoil inlet wire	1	1
29		159 646	CLAMP, motor base	1	1
30		159 647	INSULATOR, motor clamp	1	1
		180 146	KIT, trigger isolation (consisting of)	1	1
		180 118	CIRCUIT CARD, assembly trigger	1	1
		180 277	PLUG, assembly	1	1
		180 276	PLUG/LEADS	1	1

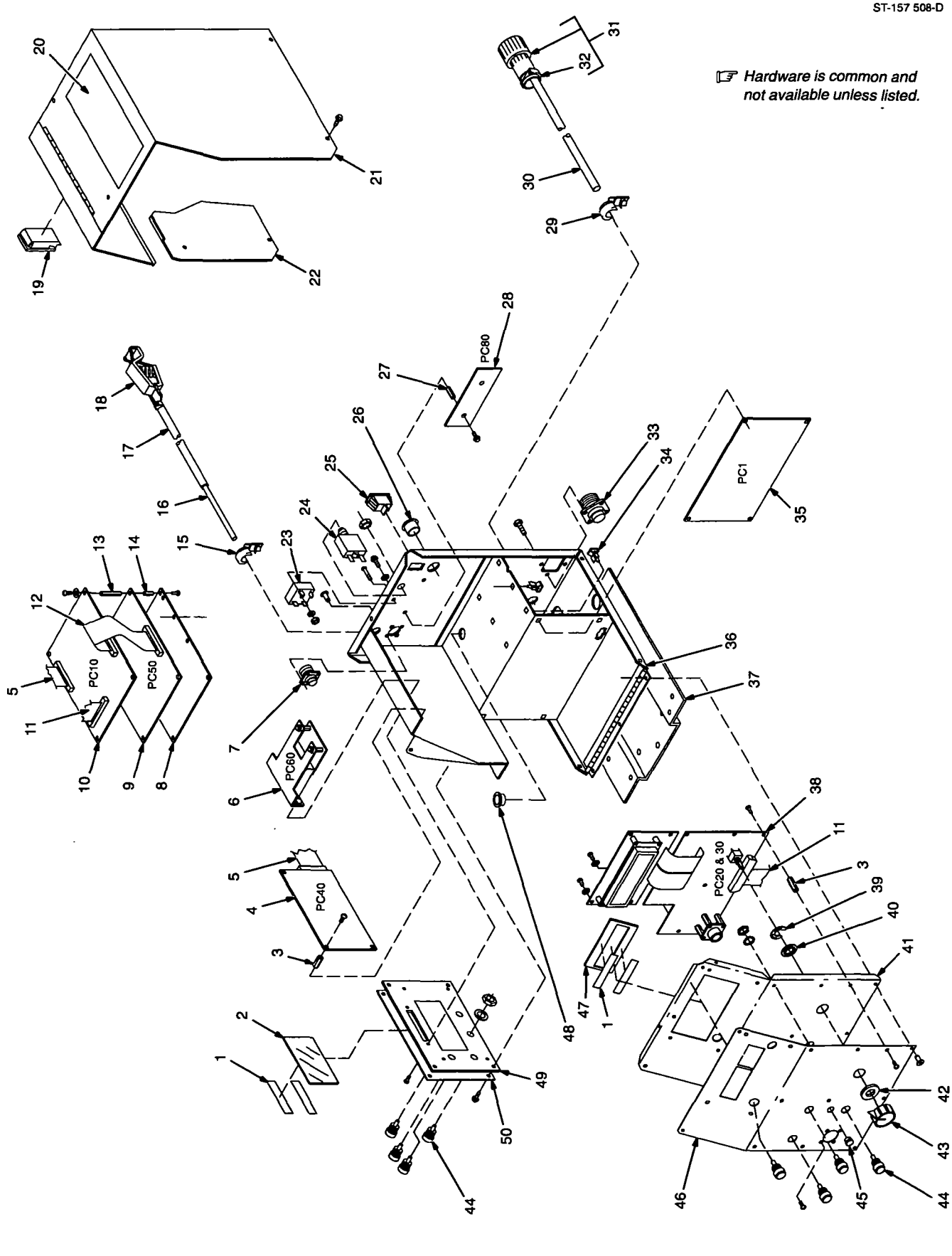
Note: When ordering Control Box contact factory service department for proper number.

♦OPTIONAL

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

13.2 Control Box (Fig 13.1 Item 2)

ST-157 508-D



Item No.	Dia. Mkgs.	Part No.	Description	Quantity
1		147 139	TAPE, adh acrylic double sided .010 x .500 x 3.000	4
2		155 024	LENS, clear anti glare	1
3		144 844	STAND-OFF, No. 6-32 x .875 lg	14
4	PC40	158 160	CIRCUIT CARD, schd side	1
5	PLG16,41	155 023	CABLE, ribbon 24posn 6.000 in (RC16) (RC14)	1
6	PC60	156 623	CIRCUIT CARD, cyber card	1
	PLG60	153 501	CONNECTOR & SOCKETS (RC60)	1
7	RC70	048 282	CONNECTOR w/SOCKETS	1
		079 532	CONNECTOR, circ 4 pin Amp 211882-1	
		079 535	CONNECTOR, circ pin push-in 18-14ga Amp 66359-6	
		079 531	CONNECTOR, circ clamp str rlf Amp 206358-2	
8		154 938	STRIP, mtg PC card	1
9	PC50	163 917	CIRCUIT CARD, interface	1
	PLG51	158 720	CONNECTOR & SOCKETS (RC51)	1
	PLG52	158 719	CONNECTOR & SOCKETS (RC52)	1
	PLG53	131 204	CONNECTOR & SOCKETS (RC53)	1
	PLG54	148 439	CONNECTOR & SOCKETS (RC54)	1
	PLG55	115 092	CONNECTOR & SOCKETS (RC55)	1
10	PC10	184 775	CIRCUIT CARD, processor w/proms	1
	PLG11	115 092	CONNECTOR & SOCKETS (RC11)	1
	PLG15	153 501	CONNECTOR & SOCKETS (RC15)	1
	PLG17	115 093	CONNECTOR & SOCKETS (RC17)	1
	PLG18	162 382	CONNECTOR & SOCKETS (RC18)	1
11	PLG10,24	170 980	CABLE, ribbon 34posn 12.000 in (RC10) (RC24)	1
12	PLG12,50	155 629	CABLE, ribbon 14posn 3.000 in (RC12) (RC50)	1
13		126 689	STAND-OFF, 6-32 x 1.500 lg	4
14		097 132	STAND-OFF, 6-32 x .375 lg	4
15		138 044	BUSHING, strain relief .120/.150 ID x .500mtg hole	1
16		600 399	WIRE, strd 14ga blk 600V 105C (order by ft)	35ft
17		176 089	TUBING, plstc PVC .250 ID x .370 OD x 9.000	1
18		601 222	CLAMP, univ 50A	1
19		089 899	LATCH, slide flush	1
20		134 464	LABEL, warning general precautionary	1
21		+154 927	WRAPPER	1
22		155 261	PANEL, side lower	1
23	SR1	035 704	RECTIFIER, integ 40A 800V	1
24	CB1	083 432	CIRCUIT BREAKER, man reset 1P 10A 250V	1
25	S1	111 997	SWITCH, rocker SPST 10A 250VAC	1
26		000 527	BLANK, snap-in nyl .875mtg hole	1
27		073 756	STAND-OFF, 6-32 x .625 lg	2
28	PC80	182 299	CIRCUIT CARD, HF filter	1
	PLG81	115 093	CONNECTOR & SOCKETS	1
	PLG82	158 720	CONNECTOR & SOCKETS (RC82)	1
	PLG83	115 092	CONNECTOR & SOCKETS (RC83)	1
	PLG89	131 054	CONNECTOR & SOCKETS (RC89)	1
29		010 290	BUSHING, strain relief 1.030 ID	1
30		163 520	CABLE, port No. 18/14 11/c (order by ft)	17ft
31	PLG9	141 162	CONNECTOR & PINS, (consisting of)	1
32		079 739	CONNECTOR, circ clamp str rlf sz 17 & 20	1
33	RC40	047 637	CONNECTOR & SOCKETS	1
		048 144	CONNECTOR, circ pin plug keying in sockets	2
34		134 201	STAND-OFF SUPPORT, PC card .312/.375	8
35	PC1	183 120	CIRCUIT CARD, motor control	1
	PLG1	115 092	CONNECTOR & SOCKETS (RC1)	1
	PLG2	115 093	CONNECTOR & SOCKETS (RC2)	1
	PLG3	115 094	CONNECTOR & SOCKETS (RC3)	1
	PLG4	115 091	CONNECTOR & SOCKETS (RC4)	1
	PLG6	136 810	CONNECTOR & SOCKETS (RC6)	1
36		181 499	CASE SECTION, bottom/rear	1

13.2 (Continued)

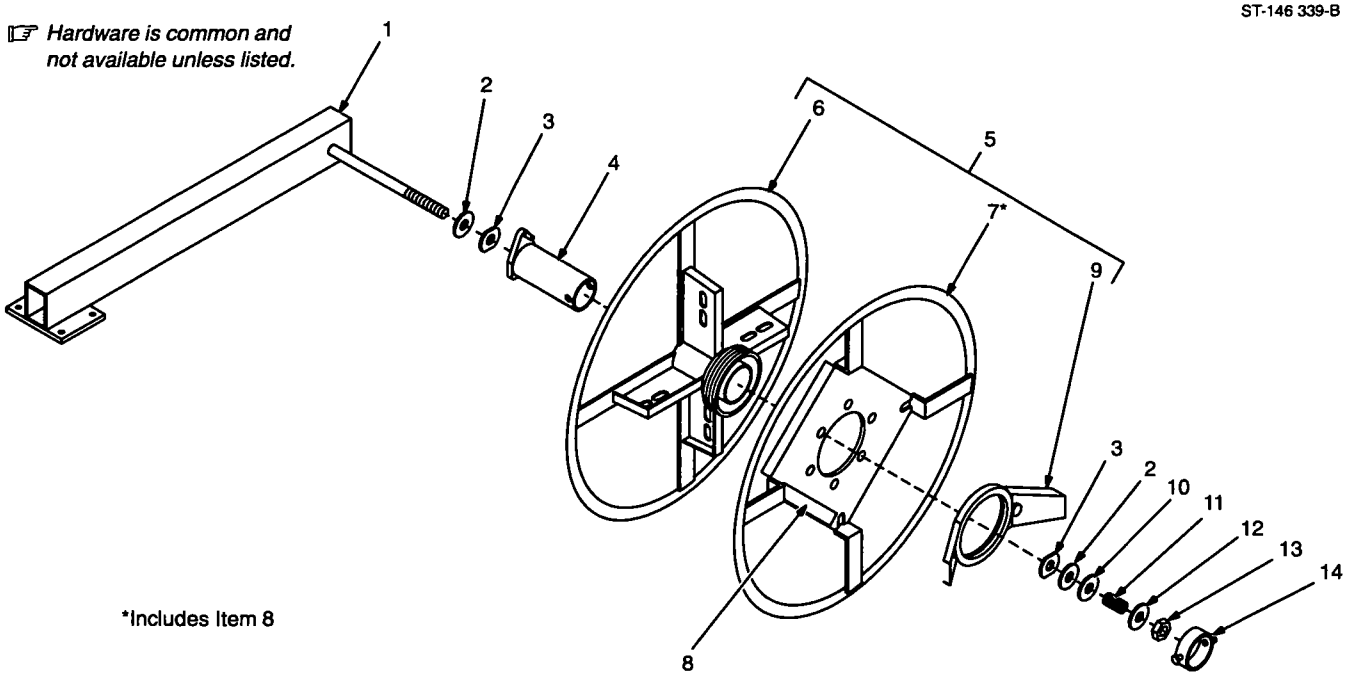
Item No.	Dia. Mkgs.	Part No.	Description	Quantity
37		145 948	BRACKET, mtg control box	1
38	PC20,30	169 502	CIRCUIT CARD, display front	1
	PLG25	164 899	CONNECTOR & SOCKETS (RC25)	1
39		159 264	RING, retaining ext .625 shaft grv x .045thk E style	1
40		167 633	WASHER, shldr .612 ID	1
41		167 698	PANEL, front	1
42		010 291	WASHER, flat .625 ID nylafil	1
43		167 700	KNOB, pointer	1
44		153 169	ACTUATOR, switch	8
45		179 201	LENS, LED 4345 green	1
46			NAMEPLATE, (order by model and serial number)	1
47		164 842	METER LENS, w/gasket	1
48		030 170	BUSHING, snap-in nyl .750 ID x 1.000mtg hole	1
49		154 933	PANEL, inner control	1
50		154 109	PLATE, ident inner control	1
	PLG39	115 092	CONNECTOR & SOCKETS	1
	RC7	135 409	CONNECTOR & SOCKETS	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

13.3 Support, Hub & Reel (Fig 13.1 Item 12)

ST-146 339-B

☞ *Hardware is common and not available unless listed.*



*Includes Item 8

Item No.	Part No.	Description	Quantity
1	142 399	SUPPORT, reel	1
2	010 191	WASHER, fbr .656 ID x 1.500 OD x .125thk	2
3	058 628	WASHER, brake stl	2
4	058 428	HUB, spool	1
5	♦108 008	REEL, wire 60 lb (consisting of)	1
6	124 900	SUPPORT, reel spool	1
7	+168 104	RETAINER, spool support (consisting of)	1
8	166 594	LABEL, caution falling wire reel can cause damage	1
9	168 103	NUT, spanner retaining	1
10	057 971	WASHER, flat stl keyed 1.500dia x .125thk	1
11	010 233	SPRING, cprsn .970 OD x .120 wire x 1.250	1
12	605 941	WASHER, flat stl .640 ID x 1.000 OD x 14ga thk	1
13	136 684	NUT, stl slflkg hex reg .625-11 w/nylon insert	1
14	058 427	RING, retaining spool	1

♦OPTIONAL

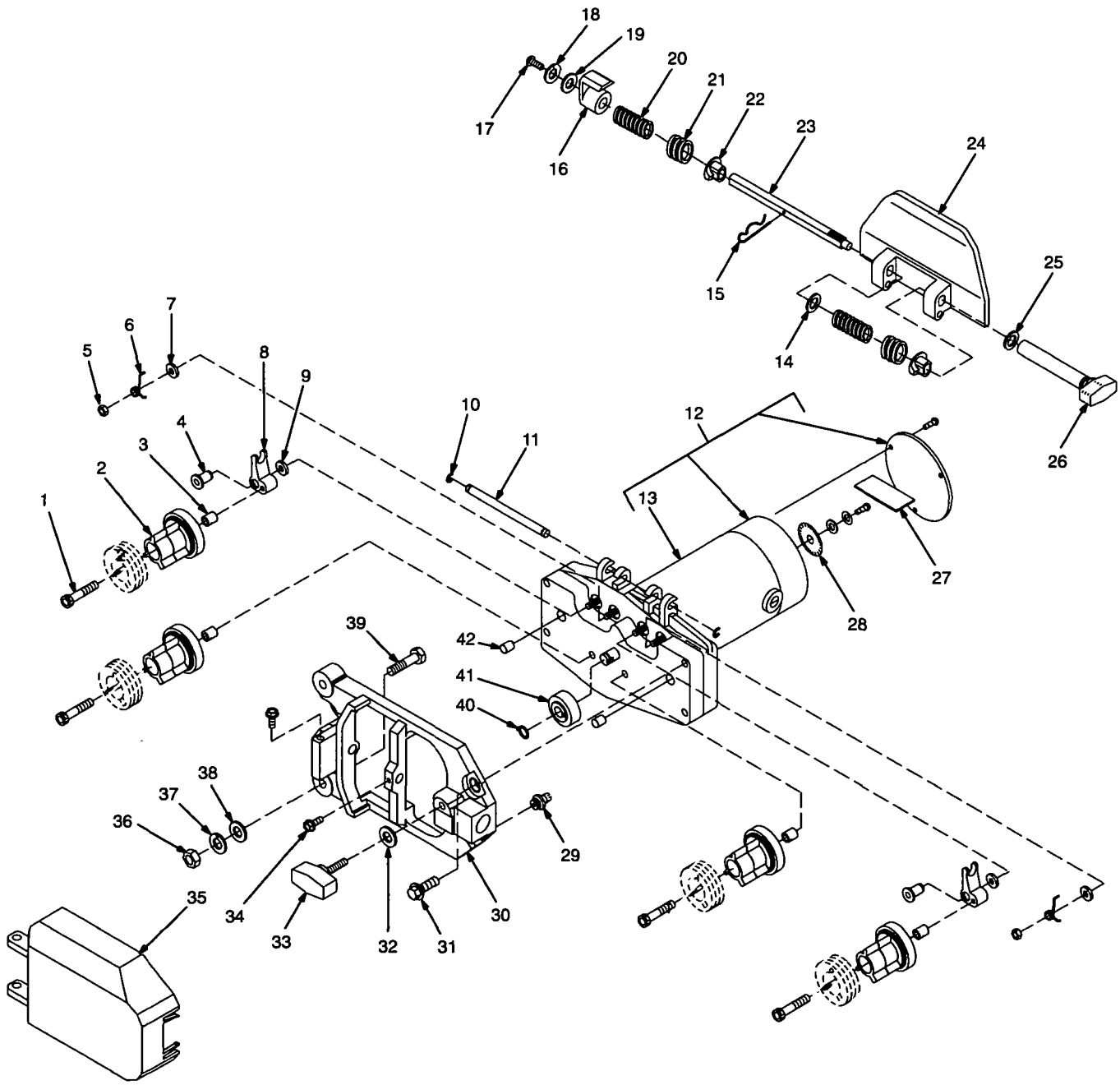
+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

13.4 Drive Assembly, Wire (Fig 13.1 Item 25)

ST-801 456-A

☞ *Hardware is common and not available unless listed.*



Item No.	Dia. Mkgs.	Part No.	Description	Quantity
1		010 668	SCREW, cap stl sch .250-20 x 1.500	4
2		172 075	CARRIER, drive roll w/components 24 pitch	4
3		149 962	SPACER, carrier drive roll	4
4		149 486	PIN, rotation arm rocker	2
5		163 282	NUT, .250-28 stl	2
6		165 798	SPRING, pressure arm retaining	2
7		165 799	WASHER, flat .257 ID stl	2
8		132 750	ARM, pressure	2
9		150 520	SPACER, rotation pin	2
10		133 493	RING, retaining ext .250 shaft x .025thk	2
11		133 350	PIN, hinge	1
12	M1,2	156 354	MOTOR, gear 1/8hp 24VDC 272RPM (consisting of)	1
12	M1,2	♦156 353	MOTOR, gear 1/8hp 24VDC 500RPM (consisting of)	1
		153 491	KIT, brush replacement (consisting of)	1
		153 492	CAP, brush	2
		*153 493	BRUSH, carbon	2
13		155 098	KIT, cover motor gearbox (consisting of)	1
		153 550	COVER, motor gearbox (consisting of)	1
		155 099	GASKET, cover	1
		155 100	SCREW, cover	5
		154 031	SPACER, locating	2
		133 493	RING, rtng ext .250 shaft grv x .025thk	1
		184 136	KIT, brush holder	1
14		182 414	WASHER, flat	1
15		182 415	PIN, cotter hair	1
16		137 248	SPRING, indicator	1
17		129 351	SCREW, hexwhd-slt stl slffmg 8-32 x .500	1
18		602 200	WASHER, lock stl split No. 8	1
19		604 772	WASHER, flat stl SAE No. 8	1
20		182 156	SPRING, cprsn	2
21		182 155	SPRING, cprsn	1
22		132 746	BUSHING, spring	2
23		181 522	SHAFT, spring	1
24		132 747	CARRIER, shaft	1
25		133 739	WASHER, flat .375 ID x .625 OD x .062	1
26		183 330	KNOB, extension	1
27	PC51	♦♦153 631	CIRCUIT CARD, digital tach (consisting of)	1
	PLG57	131 204	CONNECTOR & SOCKETS	1
		604 311	GROMMET, rbr .250 ID x .375mtg hole	1
	PLG58	131 203	CONNECTOR & PINS	1
28		♦♦132 611	OPTICAL ENCODER DISC	1
29		149 959	FITTING, brs barbed M 3/16tbg x .312-24	1
30		179 265	ADAPTER, gun/feeder LH	1
31		108 940	SCREW, cap stl hexwhd .250-20 x .750	4
32		604 538	WASHER, flat stl SAE .312	1
33		151 437	KNOB, plstc T 1.125 lg x .312-18 x 1.500 bar	1
34		128 237	SCREW, hexwhd-slt stl slffmg 10-32 x .500	2
35		+179 263	COVER, drive roll (consisting of)	1
		178 937	LABEL, warning electric shock and pinch	1
36		601 872	NUT, stl hex full .375-16	1
37		602 213	WASHER, lock stl split .375	1
38		602 243	WASHER, flat stl .375	1
39		601 966	SCREW, cap stl hexhd .375-16 x 1.250	1
40		167 387	SPACER, locating	2
41		168 825	DRIVE, pinion 40T 24P .376 bore	1
42		133 308	RING, retaining ext .375 shaft x .025thk	1

♦Part of 132 129 Optional High Speed Motor

*Recommended Spare Parts.

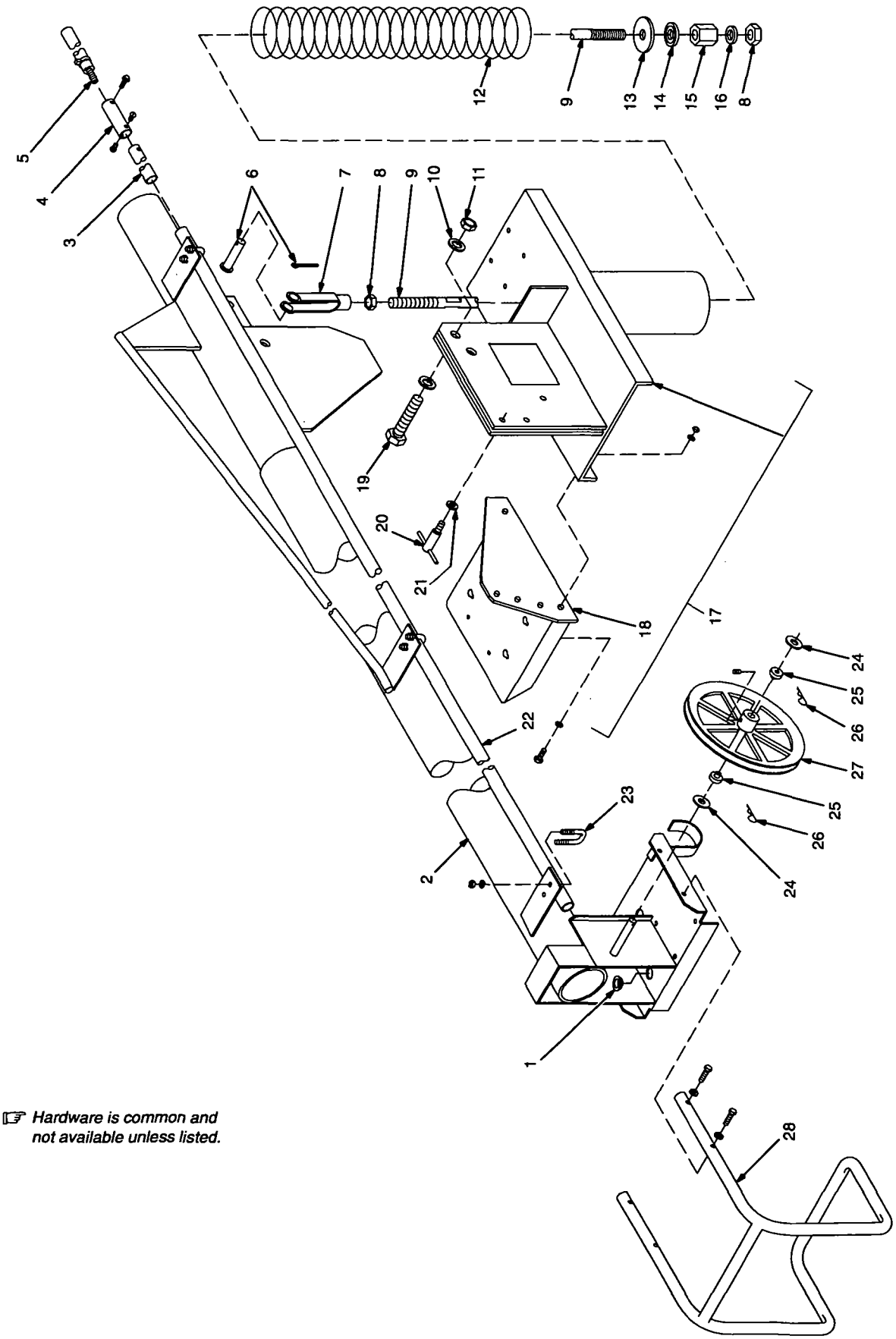
♦♦Part of Option 148 098 Two Meter w/Tach.

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

13.5 Boom Assembly (Fig 13.1 Item 15)

ST-142 601-E



☞ *Hardware is common and not available unless listed.*

Item No.	Part No.	Description	Quantity Model 12	16
1	010 493	BUSHING, snap-in nyl .625 ID x .875mtg hole	1	1
2	159 991	BOOM, single	1	
2	159 989	BOOM, single		1
3	079 665	GUIDE, wire	1	
3	080 811	GUIDE, wire		1
4	079 664	GUIDE, wire inlet	1	1
5	139 633	LINER, monocoil 3/32-1/8 wire x 15.687	1	1
6	073 742	PIN, clevis .750 OD x 2.156 lg	1	1
7	073 741	CLEVIS, .812 yoke 6.062 lg .750-16thd	1	1
8	079 029	NUT, stl hex full fnsh .750-16	2	2
9	075 462	SHAFT, boom counterbalance	1	1
10	602 250	WASHER, flat stl SAE .750	2	2
11	079 020	NUT, stl hex elastic stop .750-16	1	1
12	149 858	SPRING, cprsn 3.750 OD x .625 wire x 36.000	1	
12	080 723	SPRING, cprsn 3.750 OD x .687 wire x 33.750		1
13	150 258	RETAINER, spring	1	1
14	024 605	BEARING, ball thr sgl row .750 x 1.625 x .625	1	1
15	075 101	NUT, stl hex special .750-16 x 1.250	1	1
16	079 030	WASHER, lock stl ext tooth .750	1	1
17	+174 754	BASE, swivel boom (consisting of)	1	1
18	174 688	.... BRACKET, mtg control tilt	1	1
	080 157	.... FITTING, grease 1/8NPT	1	1
	142 804	LABEL, Swingarc caution heavy spring	1	1
	134 327	LABEL, warning general precautionary	1	1
19	073 666	SCREW, mach stl hexhd .750-16 x 2.750	1	1
20	047 224	KNOB, T-bar .500-13thd	1	1
21	602 246	WASHER, flat stl std .500	1	1
22	079 667	PIPE, plstc .500 x 133.750	1	
22	080 812	PIPE, plstc .500 x 181.750		1
23	079 632	BOLT, U stl .250-20 x .875 wide x 1.375 deep	4	5
24	010 910	WASHER, flat stl std .406 ID x .812 OD x .065thk	2	2
25	079 622	WASHER, shld .318 ID x .750 OD x .254thk	2	2
26	010 313	PIN, cotter hair .072 x 1.437	2	2
27	079 621	PULLEY, V sgl grv 8.875dia x 8.000P x .375 bore	1	1
28	139 336	GUARD, motor protector	1	1
	149 322	CLAMP, hose .405 – .486clp	2	2

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

13.6 Drive Roll & Wire Guide Kits

S-0549-C

Wire Size		Inlet Guide	Intermediate Guide	V-GROOVE		U-GROOVE		VK-GROOVE		UC-GROOVE	
Fraction	Metric			4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll
.023-.025 in.	0.6 mm	150 993	149 518	151 024	087 130						
.030 in.	0.8 mm	150 993	149 518	151 025	053 695						
.035 in.	0.9 mm	150 993	149 518	151 026	053 700	151 036	072 000	151 052	132 958		
.045 in.	1.1 mm	150 994	149 519	151 027	053 697	151 037	053 701	151 053	132 957	151 070	083 489
.052 in.	1.3 mm	150 994	149 519	151 028	053 698	151 038	053 702	151 054	132 956	151 071	083 490
1/16 in. (.062 in.)	1.6 mm	150 995	149 520	151 029	053 699	151 039	053 706	151 055	132 955	151 072	053 708
.068-.072 in.	1.8 mm	150 995	149 520					151 056	132 959		
5/64 in. (.079 in.)	2.0 mm	150 995	149 520			151 040	053 704	151 057	132 960	151 073	053 710
3/32 in. (.094 in.)	2.4 mm	150 996	149 521			151 041	053 703	151 058	132 961	151 074	053 709
7/64 in. (.110 in.)	2.8 mm	150 996	149 521			151 042	053 705	151 059	132 962	151 075	053 711
1/8 in. (.125 in.)	3.2 mm	150 997	149 522			151 043	053 707	151 060	132 963	151 076	053 712

S-0549-C

Each Kit Contains An Inlet Guide, Intermediate Guide, And 045 233 Antiwear Guide With 604 612 Setscrew 8-32 x .125, Along With 4 Drive Rolls.
2 Kits Required For Dual Models.

Options and Accessories

SS-60M

9/96

Skill Level Index
The box to the right of the stock number of field-installed options contains a letter and number. The letter indicates the skill level required to install the option. The number indicates the approximate time required for installation (see legend).

A– Easy. No previous experience needed.
B– Average. Requires removal of service panels. Mechanical ability is helpful.
C– Difficult. May require the use of an ohmmeter and/or splicing of electrical wires. Repair or replacement of component parts is more difficult.
D– Technical. May require the use of an ohmmeter and the ability to read a circuit diagram. Repair or replacement of component parts is complex.

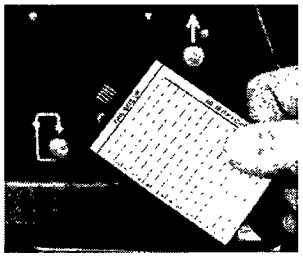
Example:

B :30 Skill Level: B, Time: 30 minutes

Weld Current Sensor #160 963 A :05
Required when using the 60M feeder with Miller conventional MIG power sources that do not have 17-pin receptacle.

Power Source Data Card for XMT 304 CC/CV #043 390
Simply insert the Data Card in the 60M control and with the push of a button the eight synergic pulse programs for the XMT 304 are loaded in memory and ready to use.

The eight XMT programs are for:
.030 in steel wire with Argon/CO_2
.035 in steel wire with Argon/CO_2
.045 in steel wire with Argon/CO_2
.030 in SS wire with Pulse tri-mix
.035 in SS wire with Pulse tri-mix
.045 in SS wire with Pulse tri-mix
.035 in SiB wire with Argon
.035 in Nickel wire with Ar/He

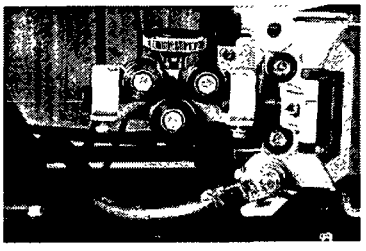


60M Data Card #155 910
Blank Card. Stores up to 32 complete weld programs. Ideal for saving custom programs and transferring programs to other 60M feeders.

Remote Program Selectors
RPS-8 #160 977 Field B :20
RPS-8 Mini #173 047 Field B :20
Eight-position rotary switch used to remotely select weld programs. Includes 33 ft (10 m) cord.

Automation Upgrade Module #172 886
This module consists of an I/O board and software upgrade that enables the 60M control to better communicate with other peripheral equipment and improves performance in an automatic welding cell.

Features: two programmable outputs, remote start/stop, remote program select, arc voltage monitor, arc error monitor and wire stuck check.



Wire Straightener
For .035–.045 in (0.9–1.1 mm) wire
#141 580 A :05

For 1/16–1/8 in (1.6–3.2 mm) wire
#141 581 A :05

Reduces cast in wire. Improves wire feeding performance and increases life of gun liner and contact tip.

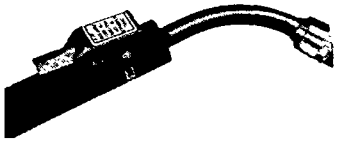
High-Speed Motor
For single and right side of dual models.
#132 129 Factory only

For left side of dual wire models.
#132 130 Factory only

Provides wire speed range of 90–1400 IPM (2.3–35.6 m/min). **Not** recommended for wire sizes larger than 5/64 in (2.0 mm).

Same speed motor must be used on each side of the dual wire models. Factory-written synergic Pulse MIG programs will not operate with high-speed motor.

Dual Schedule Switches
For use with Dual Schedule Control in 60M feeder.



DSS-8 #079 693 A :05
Requires adapter cord #157 364. Two-position trigger switch that easily attaches to the welding gun. Use in place of the standard trigger for dual scheduling.

DSS-9M #041 793 A :05
Two-position slide switch that attaches to the welding gun. Selects welding condition when utilizing the dual schedule feature. Gun trigger operates as standard trigger.

DSS-10 Remote Increase/Decrease Switch #042 749 A :05
Two-position, momentary contact switch that attaches to the welding gun. Use with the Remote Parameter Increase/Decrease feature to fine tune parameters at the welding gun while welding. Gun trigger operates as standard trigger.

Adjustable Spool Carrier #096 075 A :20
For use only with Swingarc models with 6 ft (1.8 m) pipe post mounted on Swingpak base.

Replaces standard spool assembly. Positions welding wire lower for easier loading and unloading.

Extension Cords
For optimum performance, do not extend 60M feeder more than 60 ft (18 m) from power source.

14-Pin Extension Cord
#043 690 25 ft (7.6 m)
#043 691 50 ft (15 m)

Water Coolant Systems
Refer to Water Coolant Systems literature, Index No. AY/7.2.

One of the following is required for mounting the SS-60M and DS-60M Swingarc™ booms:

- Swingpak Base — pipe post with base plate
- CBC Cart (for use with 12 ft [3.7 m] model only) — the 6 ft (1.8 m) pipe post without base plate (ordered separately)
- Pipe Post

The Swingpak™ Bases

Order a Swingpak-12 base to mount a 12 ft (3.7 m) boom. The Swingpak-16 base is for use with a 16 ft (4.9 m) boom.

Each base accommodates a power source, Swingarc feeder system, water coolant system, and gas cylinder. The base plate is solid to help better organize components and cables. Base includes a three-compartment storage locker. The entire unit can be moved with a forklift truck.

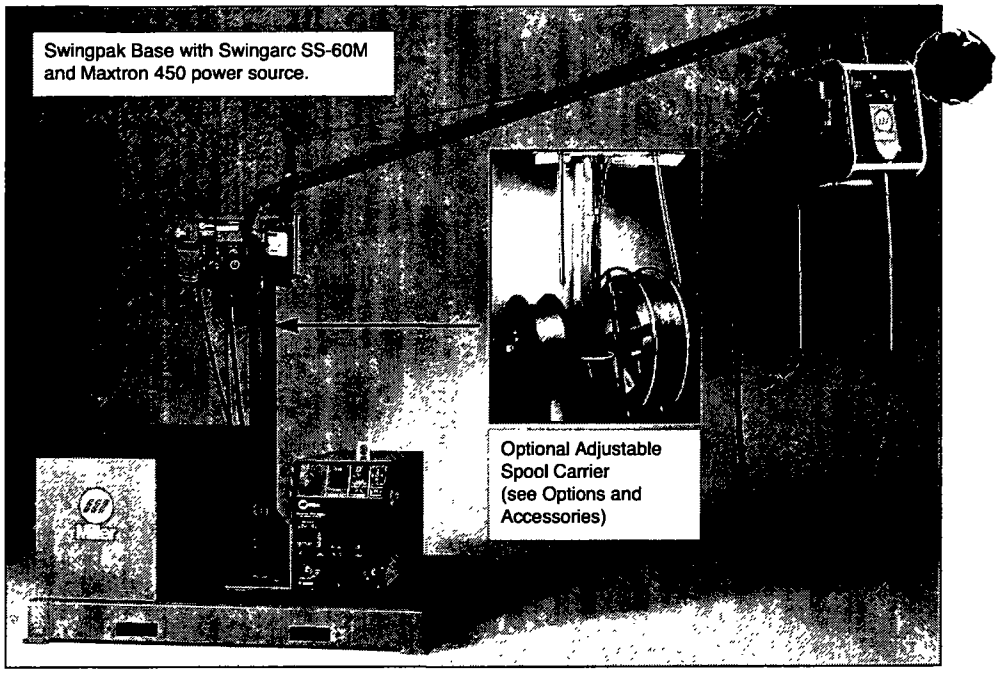
CBC Carts

For use with 12 ft (3.7 m) boom only. The CBC Cart accommodates a power source, 12 ft (3.7 m) Swingarc feeder, and two gas cylinders. Designed to provide mobility and a neat, orderly arrangement of welding equipment. The CBC is the standard model with 10 in (254 mm) diameter by 2 in (51 mm) wide wheels. The CBC-HD heavy-duty model is designed for use on rough or uneven surfaces and features 12 in (305 mm) diameter by 3 in (76 mm) wide wheels.

Note: The 4 ft (1.2 m) pipe post is not recommended for use with the CBC Cart. The 16 ft (4.9 m) Swingarc feeder cannot be used.

CBC Cart Features

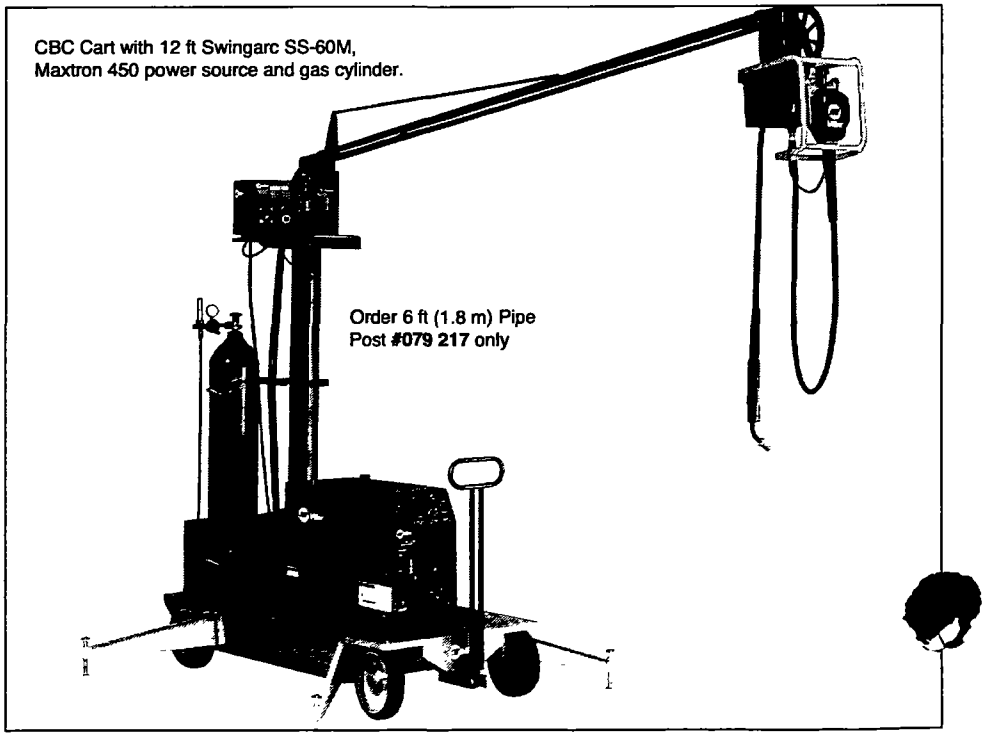
- 2000 lb (907 kg) load capacity
- Multi-position boom
- Swing-out outriggers
- Wide front-wheel stance and automotive-type steering
- Mounting facilities for most Miller CV power sources
- Compartment in base of cart to add ballast weight when using lightweight power sources. Minimum ballast weight of 300 lb (136 kg) required
- Fold-up gas bottle loading ramp


Swingpak Base with Swingarc SS-60M and Maxtron 450 power source.
Optional Adjustable Spool Carrier (see Options and Accessories)

Specifications and Ordering Information

Model	Stock No.	Length	Width	Net Weight	Ship Weight
Swingpak-12	#085 276	65 in (1.7 m)	50⅞ in (1.3 m)	412 lb (187 kg)	418 lb (190 kg)
Swingpak-16	#085 934	79 in (2.0 m)	66⅞ in (1.7 m)	504 lb (229 kg)	510 lb (231 kg)
CBC Cart	#152 638	68 in (1.7 m)	34 in (864 mm)	295 lb (134 kg)	434 lb (197 kg)
CBC-HD Cart	#152 637	70 in (1.8 m)	34 in (864 mm)	328 lb (149 kg)	510 lb (231 kg)

Pipe Post Model	For 12 ft Boom (3.7 m) (18 in (457 mm) Base Plate)	For 16 ft (4.9 m) Boom (24 in (610 mm) Base Plate)
4 ft (1.2 m) no base	#075 078	#075 078
4 ft (1.2 m) with base	#149 838	#078 264
6 ft (1.8 m) no base	#079 217	#079 217
6 ft (1.8 m) with base	#149 839	#079 216



TRUE BLUE® WARRANTY

Effective January 1, 1997
(Equipment with a serial number preface of "KH" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Robots (1 year labor)
   * Engine Driven Welding Generators (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * Motor Driven Guns
   * Process Controllers
   * IHPS Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   * Deutz Engines (outside North America)
   * Field Options (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)

Miller's True Blue® Limited Warranty shall not apply to:

1. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Warranty Questions?

Call 1-800-4-A-MILLER for your local Miller distributor.

Miller
The Power of Blue.

Owner's Record

Please complete and retain with your personal records.

Model Name	**Serial/Style Number**
Purchase Date	(Date when equipment was delivered to original customer.)
Distributor	
Address	
City	
State	**Zip**

Resources Available

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables
	Options and Accessories
To locate the distributor nearest you, call 1-800-4-A-Miller.	Personal Safety Equipment
	Service and Repair
	Replacement Parts
	Training (Schools, Videos, Books)
	Owner's Manuals
	Technical Manuals (Servicing Information and Parts)
	Circuit Diagrams
	Welding Process Handbooks
Contact the Delivering Carrier to:	File a claim for loss or damage during shipment.
For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.	

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